The Builder.

VOL. LXIII. No. 2596. NOVEMBER 5, 1892.

ILLUSTRATIONS.

Truro Cathedral from the South-west, as it will appear when Completed.—Mr. J. L. Pearson, R.A., Architect ..... *Extra-Large Ink-Photo.*
Cathedrals of England and Wales: XXIV., Truro.—Drawn by Mr. A. N. Prentice, A.R.I.B.A. ..... *Double-Page Photo-Litho.*
Plan of Truro Cathedral ..... *Double-Page Photo-Litho.*
Design for East Window, St. Margaret's Church, Lowestoft.—By Mr. Edward Frampton ..... *Double-Page Ink-Photo.*

CONTENTS.

Bloomsbury and St. Giles'-in-the-Fields 347
The Building Stones of Malta 349
Notes 349
Letter from Paris 351
Miss Penrose's Lectures 352
The Royal Commission on Metropolitan Water Supply 353
Truro Cathedral 356
Design for East Window, St. Margaret's, Lowestoft 357
The London County Council 357
Birmingham Architectural Association 358
Working Rules for the Building Trades of London 358
Books: C. Waldstein's "Excavations of the American School of Athens at the Heraion of Argos" (London and Berlin: Ascher & Co); H. Brunn's "Griechische Götterideale in ihren Formen erläutert"; Max Ohnefalsch-Richter's "Die antiken Kultusstätten auf Kypros"; "The Timber and Wood Consuming Trades Directory" (London: 14, Bartholomew-close) 358
"Architecture a Profession or an Art" 359
Bones as a Building Material 360
Local Control over Drainage and Sanitary Work 360
Competition and Cost 360
"Wanted, a Fifteenth-century Sculptor" 360
Walsall Baths Competition 360
The Student's Column: Concrete.—XIX. 361
General Building News 362
Sanitary and Engineering News 363
Foreign and Colonial 363
Miscellaneous 363
Legal 364
Meetings 364
Recent Patents 364
Some Recent Sales of Property 365

Bloomsbury and St. Giles'-in-the-Fields.

ON June 13 last year, shortly after the late Duke of Bedford's death, we gave an account, in outline, of a London estate that has formed a heritage of his house since the marriage of Rachael, widow of Francis, Lord Vaughan to William, Viscount Russell. The development from that time can be clearly traced. For earlier events, together with its close association with St. Giles'-in-the-Fields, we have hitherto been dependent mainly upon the quarto volume published in 1822 by John Parton, Vestry Clerk of that parish. A new historian claims attention with a book which we opened in expectation and closed in amazement, so different is it from any recent work of its kind, and calculated to fairly surprise everyone who relies upon the ordinary text-books.*

"I owe much," Mr. Blott writes, "to John Parton's work . . . for by its errors I was led to greater research, and found the chronicle of Blemundsbury underlying the early history of St. Giles'-in-the-Fields." He contends that Blemundsbury existed, and, for a while as a royal manor, centuries before there was any parish of St. Giles. He traces its possession by Roger de Bellomonte, or Blemonte, Earl of Mellent and of Leicester, first lord by the Conqueror's favour, and his descendants, to the time of Robert Fitzparnell, second son of William de Leporus, at whose death, *s.p.* in 1204, it passed to the De Spencers, of Beaumont, in Maine, whose name and work are recognised in "Spencer's Dig" and "Blemunde's Ditch," south and north of High Holborn. Meanwhile Queen Matilda founded a lazar house or leper hospital, dedicated to St. Giles, whose site is shown in our plan of June 13: it was established, urges Mr. Blott, in Blemundsbury.

Rowland Dobie deals at length with this matter of locality in his "History of the United Parishes of St. Giles'-in-the-Fields and St. George, Bloomsbury," second edition, 1834. He points out that the parish is not cited in Pope Nicholas IV.'s "Valor" for 1291, which contains the whole archdeaconry of the county; St. Giles and Bilumond are described as sokes, or liberties, in the Nona Rolls, 14 Edward III.; all the charters down to Edward III. speak of the hospital, but are silent as to the parish; and that only five (which he enumerates) of ninety-two recorded grants to the hospital specify the parish; so similarly for two out of ten obits. Again, we read in Newcourt's "Repertorium":—

> "I find no Institution to any Church in this parish till after this hospital was suppress'd. . . . . The first Institution that I find to this Church, as parochial, and a rectory, was on the 20th of April, 1547."

This upon Sir Wimund Carew's presentation; the next institution is by Queen Elizabeth, whenceforward the advowson continues in the Crown.

> "The Mansion-house or Bury of Blemund, was built in nearly the centre of the estate, on a piece of ground lying between what is now the Church of St. Giles'-in-the-Fields on the east, and Charing Cross-road on the west. . . . . The main western highway ran by it on the north side, and a few straggling huts, or cottages, on the roadside opposite nestled under the shadow of the building. . . . The name of Alde Wyche brings before the reader a Saxon village that was there long before the village of "Sci Egidij" (St. Giles), for there is no mention of the village of St. Giles in the Domesday Book. . . . . A reference to AGGAS [Agas] clearly shows that Hog-lane was not an ancient thoroughfare, but was probably made a "way" about the time of Richard III. An ancient road existed on the east side, called Elde Strate, or Alde Strate, and, with certain alterations, is still a way, and now bears the name of Shaftesbury-avenue. . . . . Lord Blemund, who seems to have been a leper, moved the King and Queen to assist him in providing an asylum for those suffering from the terrible disease of leprosy. . . . . He allowed a leper hospital to be built . . . . between his mansion and the church, which stood at the corner of Elde Strate. Near the church a building had been erected in Elde Strate, known as Le Cloche Hose."

So Mr. Blott places Eld-street along Monmouth (since Dudley) street; whilst the Bell House appears to coincide with the Cloche Hose inn, marked with a hanging sign, by Parton. It was owned, in 1272, by Herbert de Redemere, or Redvers, the hospital cook; and since he was a Templar and a Crusader, says Mr. Blott, the sign became corrupted "to the 'Crossed Hose,' or crossed stockings on the crossed legs of Crusaders." He believes, then, that crossed legs indicate a Crusader. Manor-house, its site latterly marked by Denmark-place and Lloyd's-court, adjoined the White House,—so called, "probably from its being faced with the old stone which was once part of the Manor-house,"—which Alicia, Lady Dudley, alienated as a rectory, and was rebuilt by her husband's father, Robert, Earl of Leicester. Before her death here, in 1669, aged ninety, Robert Sidney, who built the house in Leicester-fields, on part of the old Beaumont estate, received the title. Thomas, Lord Wharton, lived for many years in the Manor, or Dudley, House.

In his view of the parish *anno* 1570, Parton names as "Southampton House" the large tenement drawn in, or perhaps added to, Agas's map, north-east of what is taken for the "White Hart" at the corner, north-east, of Drury-lane or Via de Aldewiche (hence Wych-street).* Neglecting his dubious detail as to holdings and allotments, we may safely place Merselade, or Marshland, south of Colman's-hedge and Longmere, and as contained by the line of Crown-street (Hog-lane, Charing Cross-road), West, Castle, and Neal (King) streets. Next east are Newelond, and the extensive tract of Aldewyche, between High Holborn, Lincoln's Inn-fields, and Kemble (Fortifene-lane, Prince's) and Sardinia (Duke) streets. The three-sided plot between High-street, Great Russell and Dyot streets is the Pitaunce, or Cup of Charity, Croft (16 acres), whose western and southern sides are traversed by Blemund's Diche. Through Aldewyche, and passing about 70 ft. north of Lewkenors-lane (since Macklin-street) on to Whetstone Park flowed "Spencer's Dig." Marshland became known latterly as Cock and Pye-fields, and

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* "A Chronicle of Blemundsbury." A Record of St. Giles'-in-the-Fields and Bloomsbury, with original maps, drawings, and deeds. By Walter Blott, F.R. Hist. Soc. 1892. Published by the author at "Manningdale," South Norwood.

* This tenement and the "White Hart" appear in Braun & Hogenberg's bird's-eye view of 1572. No. 191, Drury-lane is the "White Hart." White Hart-yard, the old hostelry site, was cleared away under 47 Geo. III., c. 38, and the lane and High Holborn were widened by 7 and 15 ft., respectively. Mr. Blott considers the old "White Hart" replaced a mansion house of the Christmasse family, and that John Christmasse was "John of good memory," cited in the charter of 1101, priest of the village church. Southampton House, Bloomsbury-square, was built in 1664-5.

then as Seven-dials, where Neale began to build in 1694. The old "Cock and Pye," which stood at the south-western corner of Castle-street must not be confounded with the notorious "Magpie" or "Cock and Pie" in Drury-lane.

In identifying Blemundsbury with St. Giles's-in-the- (Westminster) Fields we may apply Pope's couplet :—

> But now (so Anne and piety ordain)
> A church collects the saints of Drury-lane.

remembering that St. George's, Bloomsbury, was taken out of St. Giles's under the Act of 1730. Its church, and that of St. Mary-le-Strand, to which Pope alludes, rank amongst the "fifty new churches." St. Giles's parish is L-shaped, having at its corners: Whitefield's Tabernacle, Tottenham-court-road, Seven-dials, Upper St. Martin's-lane, the junction of Castle-street and Drury-lane, Kemble-street, Portsmouth-street, Lincoln's Inn, Hand-court, High Holborn, Dyot-street (south end), and Torrington-place. The corners of St. George's, Bloomsbury, are the crossing of Hunter and Compton streets, Guildford-street (west end), and Kingsgate-street, High Holborn.

> "The first scene is the brow of Holborn Hill. . . . William the Norman, by virtue of conquest, is King of England, has taken up his quarters in an abandoned fortress or castle outside the western wall of London, and . . . . . the ancient fortress on Holborn Hill has changed into Staple Inn."

By Holborn-bars, therefore, we are bidden to fix a castle, standing, says Stow, near the Thames's bank, at the west end of the City, whose "choyce stones" William gave towards the rebuilding of St. Paul's after the fire of 1086. A position near the river bank points rather to Mountfitchett Tower, or the Palatine cited by FitzStephen. Camden says much of St. Paul's was built with the ruins of the Palatine, burnt down in the Conqueror's day. He adds that they took some of the stones for the new Dominican Monastery, but the Black Friars did not migrate hither from High Holborn until nearly 200 years later.

Mr. Blott says that the grounds around Montfitchette Castle were known as Fitchette-fields, Ficquet-fields, or Thicket-fields, and, lastly, as a portion of that domain, changed its name to Lincoln's Inn and Lincoln's Inn-fields. Bridewell stood by, if not on, the site of Mountfitchet: so he calls us by a somewhat "far cry" to Lincoln's Inn-fields. Of Ficquetsfields the Crace collection contains a valuable plan, finely coloured and inked-in, showing how the ground was occupied just 300 years ago. The plan, to scale of 20 yards to an inch, measures 20 in. by 16½ in., and is a copy of one made by J. Long in 1592, bearing Lord Burlington's signature. It shows the positions of Clement's-well, the Grange, the Six Clerks' Office (Hereflete's or Kedermister's Inn), and the house of Mr. Boswell (whence Boswell-court). Montfitchett's close ally, Geoffrey de Magnaville, Lord of Essex, has his stronghold too — on Holborn-hill crest, separated by Aldewyche from his Eia, or Eye, manor, since Ebury.* His grandson espouses the cause of the Empress Maud, but, captured by Stephen at St. Albans, is forced to forfeit his wide lands. King John reverses the attainder, and the Mandevilles, partially recovering themselves, merge by marriage into the De Lacys, Earls of Lincoln, from whom Lincoln's Inn is called. In a drawing Mr. Blott puts Essex House, Magnaville's fastness, at Staple-inn. Thus, we pass on to a striking chapter of the "Chronicle." A common explanation of the origin of that Inn's name is derived from Sir George Buc, who says it was the inn or hostel of the merchants of the Staple (as the tradition is), wherewith until we can learn better matter we must rest satisfied. The Staplers plied their traffic at the western end of Westminster Bridge, and, it is said, removed to Holborn on the making, *temp.* Richard II., of New Palace-yard. The author will have none of this. He sees another signification in the device of the woolpack or woolsack, in a window of the hall there :—

> There is a deeper meaning in that small square of painted glass; it points back to the time when Staple Inn was the court of the King's Justiciary, a court higher than the Chancellor's Court, into which in after times it became merged.

He claims for Staple Inn that it had been the official home of the Justiciary, Chief Justice of England, inasmuch as his court (until Henry III.'s charter of February 11, 1224-5) followed the King; and that there in Norman times stood the palace and fortress of the Deputy King, Maurice, Bishop of London, protected by the King's friend, Richard Montfitchette. Rohesia, daughter of Aubrey de Vere, Justiciary *temp.* Henry I., married Geoffrey Magnaville, first Earl of Essex. At Saffron Walden stood a castle of the Magnavilles, and an abbey founded by the pair; the Magnavilles held Essex House by Holborn-bars. So, putting these links together, Mr. Blott deduces that the young ladies of the house of Magnaville must have enjoyed the pleasant wanderings over the saffron fields of Walden, and, charmed with their verdant beauty, they appear to have reproduced a similar scene on the northern slope [Saffron-hill] of Holborn. In Edward II.'s reign Walter de Stapleton, Bishop of Exeter, is Custos of the City; to him, we are told, the Inn owes its name, and we are given many instances,—"remarks that have escaped the shipwreck of time," in Bacon's words,—worthy consideration, to show how the name of Stapleton long survived here and about. Confounding, as it seems to us, the distinct offices of Lord Chancellor, Chief Justiciary, Justiciary, and Justice Itinerant in his roll of Justiciaries at Staple Inn, Mr. Blott goes on to say that it became known as Grey's Inn from Walter de Grey, afterwards Bishop of Chester (or rather Lichfield and Coventry), whom John appointed Justiciary, or Custos, in 1205. But we must remember that the see of Chester had two or three "inns" in London. Nor do we at all follow him in placing Gray's Inn upon the south side of Holborn, and stating that its accepted history is purely fictitious. The Inn's origin is clearly traced from the Lords Gray of Wilton, of whom Reginal de Gray was seised in fee,—see the Inquisition *post mortem*, 1 Edward II., 1308,—at Portpoole, on the north side of the street, of a certain messuage with gardens and a dovecote, thirty acres of arable land, with a certain wind cornmill, held by service to the Dean and Chapter of St. Paul's. A similar inquisition, 44 Edward III., 1370-1, finds Reginald de Gray of Wilton upon Wee seised of a certain *hospitium* in "Portpole juxta Holborne," &c.; with one garden, eleven small shops, and three acres of land adjacent, of the Dean and Chapter. Another, 19 Richard II. (1396), establishes that Sir Henry Grey de Wilton had enfeoffed certain parties of his manor of Portpole, in Holburne, called "Greysyn." Mr. Blott, quoting from an article in our own columns of June 16, 1866, in which the inquisition of 44 Edward III. is cited, though not quite accurately as to its precise terms, says :—

> The inquisition referred to was in respect to the claim of Montague, Bishop of Chichester, to the reversion of Lincoln's Inn, at the expiration of a "cancelled" lease then expiring, granted . . . . to William Sulyard, 27th Henry VIII., for ninety-nine years, at an annual rent of 6*l.* 13*s.* 4*d.* The fact is that the antiquity of Lincoln's Inn is transferred to Gray's Inn, and the "inquisition" or law suit of 1634 is dated back to 1371.

Not by us, certainly: nor do we see how a Bishop of Chichester's law suit of 1634, as to the reversion of Lincoln's Inn, to which Mr. Blott refers us *passim*, can possibly be mistaken for an inquisition,—quite another thing,—of 1371 on the death of de Grey. He reads the *Builder*: we may remind him that Cumnor-place, to which we adverted in a "Note" on August 6 last, was demolished eighty years ago, and that the two old houses, "Cock and Pie," in Drury-lane, were removed two years since (see our "Note" of December 13, 1890). His illustration is a copy of S. Rawles' plate, published by J. Asperne, of Cornhill, on August 1, 1807. We have not space to deal with other matters in this book,—*e.g.*, the Lisle correspondence, Ely House, Clare Market (to which a very early origin is assigned), Tateshall (Tottenham-court), Whetstone Park, Scroop's, Hereflete's, and Lincoln's Inns, the *Domus Conversorum* (Jews' Justiciary House), &c. A few silly passages somewhat blemish a great deal that is excellent, striking, and new. The author's toilsome investigation of records, deeds, with county and family histories, yields a rich harvest, whilst some of his conclusions will not, we think, be at once accepted. It is a pity that in various instances he does not supply more precise references to his sources of information.

Nos. 246—51, High Holborn, belonging to Emmanuel College, Cambridge, represent the Spencer, or Mildmay, estate, and stand on the fore-court of Spencer House. Between Nos. 279—80 is Tichborne-court, its entrance marked, until lately, by an old gabled house, bearing a shield of the Tichborne arms,—vair, a chief or. Haydn's first home in London was at No. 45, pulled down (1881) for the First Avenue Hotel. Nos. 28-30, north side, modernised in 1852, are supposed to have been built *temp.* Edward VI. Some plans we have consulted in the Crace collection* show certain properties within the district under review. Bedford School Charity, to which we referred last week, covers parts of Bedford-row, Sandland, Green, Lamb's Conduit, East, and New North streets, Theobald's-row, Hand-court, and Featherstone-buildings; with all Harpur-street. Gower and Upper Gower streets, having Mortimer's estate (Mortimer-market) to the north, are set out for improvement of the Bedford estate, 1800; Alfred-place, with the two crescents, was first leased by the Corporation in 1802. John Dayne's "exact plott and description of certain lands being partes of the Mannor of Bloomsbury, &c., 1664-5," sets out Southampton House in the south-east corner, with "Long" (25½ a.), "Baber's" (31½ a.), "Night" (7¼ a.), and "Cowles" (4¼ a.). "Feilds"; west of "Night Feild" is "Citty Feild." Thomas Chawner and Sir James Pennethorne's printed plans for Endell-street—over Hanover and Belton streets and Bowl-yard—and for New Oxford-street bear date 1840. Plans for Lord Maynard's property in Maynard and Lawrence streets are dated 1813.

Of the architectural history of any of the more noted buildings in Bloomsbury the author has nothing to say, nor of their architects; which is somewhat disappointing, as any new information about them (if there is any to produce) would have been of interest. We do find the founder of Montague House recorded, with the remark that "it is very possible that had there not been a Montague House there would not have been a British Museum in Bloomsbury," which is probably true. But the object of the book seems to be wholly topographical and antiquarian. In this respect, though rather dry reading and, as we have intimated, somewhat eccentric in its theories, it contains a good deal of information which should be of interest to landowners and residents in the now over-built (in every sense) territory of Bloomsbury.

THE ENGLISH IRON TRADE.—The English iron market shows little sign of life, business on all hands being confined to transactions for immediate requirements, buyers clearly anticipating further declines in quotations. Crude iron is only in limited request; but values are practically unchanged. In manufactured iron there is little doing, and prices are depressed. A slightly better tone is reported in the tin-plate branch. Steel continues quiet. In the shipbuilding and engineering departments new orders are badly wanted. The coal trade, so far as household qualities are concerned, is a trifle brisker; but other qualities lack activity. The question of a full week's "play" at Christmas is being mooted. —*Iron.*

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* Castle-street, *prius* Castle-yard, is re-named Furnival-street.

* Frederick Crace, the collector, lived, 1807, in No. 55, Great Queen-street, being the western portion of the house attributed to Inigo Jones. John Crace built Nos. 53-4 in 1779, and lived in No. 54.

THE BUILDING STONES OF MALTA.

IN this country but very little is known concerning the building stones of the Maltese Islands, although samples have, from time to time, been on view at London exhibitions. In the great Exhibition of 1851, stone work was the most prominent feature of the exhibits from Malta, and comprised inlaid marble table tops, carved vases, jugs, candelabra, &c. Several of the ornamental stone vases possessed considerable merit, bearing in mind the kind of material in which they were executed, and were illustrated in the Exhibition catalogue.

Ornamental stone work from Malta also formed a conspicuous part of the exhibit at the late Colonial and Indian Exhibition; the façade outside the Maltese Court, executed in the island under the superintendence of M. Gallzia, of the Public Works Department attracted much notice. This façade made from an original design based upon German Renaissance met with at Heidelberg, was sent from Malta to London in numbered blocks, and then erected in the Exhibition grounds. But these exhibition specimens, excellent as they were, did not convey a very intelligible idea of the building stones themselves, nor of the strata from which they were obtained, and it is to these points that we desire now to call attention.

Geologically, the strata composing the Maltese Islands are of Middle Tertiary (Oligocene and Miocene) age. The following table* gives the general succession of the beds:—

Table of Maltese Strata.

Upper coralline limestone (300 feet).	*a.* White coralline limestone.	Gozo marble.
	b. Reddish yellow limestone.	
	c. Soft white limestone.	
Greensand (35 ft.).—*a.* Indurated yellow sand.		
Blue clay (40 ft.).—*b.* Friable black sand.		
Globigerina limestone (250 feet).	*a.* White rotten limestone. 1st nodule seam.	
	b. Fine hard-grained limestone. 2nd nodule seam.	
	c. Compact semi-crystalline limestone. 3rd nodule seam.	
	d. Yellowish soft limestone. 4th nodule seam.	
Lower limestone (500 feet).	*a.* *Scutella*-bed.	
	b. Hard compact limestone.	

The lower and upper (coralline) limestones are, as a rule, exceedingly compact in texture, and the uppermost beds will take a good polish, as is exemplified by the well-known Gozo marble which is obtained from them. The coralline limestone contains nodules, and is beautifully variegated in certain localities. In addition to marble, these beds yield an excellent building stone, but they are not so extensively used for that purpose, we believe, as the formation known as the *Globigerina* limestone, although being, by some, considered to be superior to the latter in quality.

According to Mr. John H. Cooke, B.Sc.,† three qualities of building stones are found in the *Globigerina*-limestone formation. The stone of the first quality is somewhat coarse-grained when compared with the others. It is, however, much used for out-door work, as, after exposure to the air, it acquires a hardness and compactness which renders it very durable. The second quality stone, when dry, presents the appearance of being as good as, if not better than, the first quality, but there is a material difference between the two,—a difference that is more easily discernible in wet than in dry weather. During the wet season this stone changes its colour and readily exfoliates, and it is therefore rendered comparatively useless for exterior work. Its brilliant white appearance and other qualities have created a demand for it for interiors. The differences in quality between these two kinds of stone are strikingly demonstrated in the exterior walls of the older houses of Luca and surrounding villages. The third-quality stone is so rotten in character that it is seldom or never used for constructional purposes.

The greater part of Valletta, Floriana Sliema, and the churches of Malta and Gozo are, according to Mr. Cooke, built of the better quality limestone of the *Globigerina* division. The special horizon varies in thickness from 25 ft. to 50 ft., following the locality; but it is found that where the bed is thin,—especially at St. Paul's Bay,—the stone is comparatively inferior in quality. The stone derived from the quarries of Tad-Dual and Tal-Gauchi is of a yellowish-white colour, and is accounted amongst the best to be found in the islands, being in constant request for decorative purposes. The same author states that two grave defects militate against its more extended use in high-class architectural work. The first of these is its great variability in colour, and the second is the frequent occurrence of unsightly blotches in the stone, caused by the presence of concretionary nodules of hematite and ironstone. These nodules, when cut through, show ugly markings which disfigure the work in which they occur. Amongst the quarrymen, the markings are known as "suaba" or finger-marks, a name suggested by the form they commonly assume. At Tal-Gandia and Tal-Balal fine-grained, compact varieties of this bed are quarried, and are largely used in the construction of tombstones and monuments. At Inghieret, in the vicinity of the Marsa, and also on the outskirts of Birchircara inferior stones are obtained.

A considerable quantity of good stone is annually raised in the island of Gozo, especially at Ta-Bardan, in Sannat, where the material is a hard, fine-grained freestone, of a pale yellow colour.

For further information on the subject the reader is referred to the treatise of Dr. J. Murray,* in which the various divisions and the microscopic structure of the rocks are clearly explained; and to various articles in the *Mediterranean Naturalist*, published in Malta.

* Gregory. Transactions of the Royal Society of Edinburgh, vol xxxvi. (1891), p. 634.

† *Mediterranean Naturalist* (1892), p. 152.

* "The Maltese Islands, with Special Reference to their Geological Structure," *Scottish Geographical Magazine*, vol. vi. (1890), pp. 449-488.

NOTES.

AS far as present information goes there seems to be little room for doubt that the dreadful railway accident near Thirsk has arisen indirectly from the system of dividing a fast train when it becomes too large to send as one train, and that either some one neglected to inform the signal-man at the Junction that the express was divided, or that he forgot the fact. The event, in that case, is a terrible lesson on the danger of thus introducing an extra loophole for an accident by dividing a fast train at a time of year when such division is not of every-day occurrence. There are two suggestions which may be made for rendering such accidents at all events less possible in the future. One is, that the running of trains in two sections, if unavoidable, should be kept up regularly and as a recognised system during the portion of the year when the fast traffic is heaviest; kept up always during that period, and between certain specified dates, and rigorously excluded at other times. Most reasonable people would surely agree that it is better to be told they must wait for the next regular train than run the risk of a terrible accident through a misunderstanding. The other safeguard which occurs to us is possibly already employed, but if not, it ought to be: it is, to have a distinct and unmistakeable extra tail-light or tail-signal at the back of the first section of the train, to show the signalmen that it is a section only, and that the remainder is following. We do not know whether any such signal is adopted, but it is a very important point, and one which ought to be touched upon at the inquest. If there is no such device in use by the railway companies in such cases, they have neglected a very simple and effectual means of guarding against such a mistake as that which probably led to the Thirsk accident.

THE first meeting of the Institute for the ensuing session is announced for Monday evening, when the President, Mr. Macvicar Anderson, will deliver his opening address, in which some of the topics so much discussed recently will no doubt be alluded to. Those who agree with the policy of the Institute will, we have no doubt, endeavour to be present on this occasion in support of the President.

IN constructing the new Charing Cross-road, the traffic from the west, by Piccadilly and Regent-street going to Charing Cross and the Strand has been overlooked. The cabmen, indeed, endeavour to force their way through the narrow, crooked little street at the south-east corner of Leicester-square, known as Green-street, and the Vestry of St. Martin's-in-the-Fields is making some intermittent efforts to widen and straighten this street, but the most direct and easy route for the western traffic would be along the top of Leicester-square and through what is now a narrow, tumble-down street, called Bear-street, at the north-east corner of the square. If this street were widened, and the angle where it enters Charing Cross-road rounded off, not only the through traffic from west to east would be benefited, but the local traffic to the numerous theatres in the neighbourhood would be relieved. A new theatre is being constructed at the north-east angle of the square, which must impede the traffic through Cranbourne-street, and there are, close by, a large Parcel Post Office, and the Empire and Alhambra theatres. The completion of the new Portrait Gallery will necessitate some alterations in the streets near it, but it is not desirable that it should be such as to encourage carriage traffic all round it; and if public meetings are to be frequently held in Trafalgar-square the route by Waterloo-place and the Haymarket to Charing Cross station and the City will be obstructed. By opening a route through Bear-street from the top of Leicester-square to Charing Cross-road the distance to the Strand by King William-street and to the station will be shortened, and the gradients will be easier than by the existing routes by Waterloo-place and the Haymarket. A glance at the map of the district shows what an admirable and necessary improvement the widening of Bear-street would be, and the present moment for making it is favourable, as some of the houses at the Leicester-square end of the street are being rebuilt, and the property on the south side of the street is in a very bad condition. Some day when the Government is sufficiently alive to the danger which the National Gallery and its collection of pictures runs from fire from the barracks and houses standing against it on the west side, a street will have to be run down from the west of Leicester-square to Pall Mall and Trafalgar-square to isolate the building, and such a street would still further relieve the north-western traffic bound to Northumberland-avenue and the Embankment and Whitehall, and the present route by Green-street further relieved of the block which at present exists. This, however, is not so urgent a street improvement as the widening of Bear-street, and must not be allowed to divert attention from it.

ON Tuesday the historical castle church of Wittenberg, which has lately been restored, was re-consecrated with much ceremony. Wittenberg Castle, to which the church belongs, was known as far back as 1179, but the presence of a place of worship within its walls can only be traced back to 1306. In 1353 this place of worship is known to have been a consecrated chapel, and after a period of re-construction, dating 1493 to 1499, it is spoken of as the Wittenberg Castle Church. In 1499 the Castle Church was consecrated as such by a Papal Nuncio, and

in 1513, when Martin Luther nailed a copy of his theses to its door, became one of the best known ecclesiastical buildings of the world. In 1640 the now venerable church lost its roof by fire, and in 1760 a conflagration, which destroyed the Castle, was the cause of a second fire, which resulted in this valuable monument of the Reformation being entirely gutted. From 1760-1765 the Wittenberg church was rebuilt, only, however, again to be made a ruin in the Franco-Prussian campaign of 1813. In 1817 there was another reconstruction, which was done in great haste, as the building was required for the celebration of an anniversary, and then, after being all but forgotten for some thirty years, plans were prepared which, after much alteration, have eventually resulted in a *bonâ fide* restoration being taken in hand. This restoration proper was not, however, commenced until 1882, when the late Emperor Frederick III. gave attention to the matter. The present Emperor, on taking the throne, saw that his deceased father's wishes were properly attended to, and had the necessary works carried out. As stated in a previous number, the eminent archæologist, Professor F. Adler, acted as architect. His name vouches for the restoration being a careful one, but we fear it can hardly be said that much of the interest of the original church has been retained after all this burning, rebuilding, and restoring.

THAT strange wave of catastrophes which every now and again rolls over our globe, bringing with it a long list of floods, wrecks, fires, &c., is apparently at present at its height. From all sides reports of calamities of various kinds reach us through the daily press, and, to our regret, we notice among them a number which are solely due to long standing negligence or stupidity, strangely contrasting with the means at the disposal of mankind in the present age. Great conflagrations such as the one at Milwaukee figure conspicuously among the disasters which could so easily be prevented. A little timely forethought in the framing of local building regulations is all that is necessary for the prevention of a spread of fire over a large area; so-called fire-surveys, the organisation of fire-brigades, &c., may be of some service, yet they are mainly for the protection of separate risks as such. It would be well if American civic authorities were at last compelled to give more attention to the concise wording and the rigid enforcement of the elementary preventive legislation necessary. Their interest at present is generally centred in the quick movement of their respective fire-extinguishing establishments. Record-breaking in such "turn-outs" is the order of the day, and the science of urban fire-prevention does not, as a rule, exist.

TWO cases which should be noted have been decided during the last few days. The first, Gillow *v.* Lord Aberdare, came before the Court of Appeal, which affirmed the decision of Mr. Justice Hawkins. As we commented on the case some months ago, it is scarcely necessary to recur to it in detail. It exemplifies a tendency of house and land agents to grasp at commissions which at the best could only be due on very slight technical grounds. The fact is, there is too great a proneness among this class of professional persons to seek to be paid for work which in reality they have not done. In the present case, Messrs. Gillow sought to make Lord Aberdare liable for a commission on the sale of his house when they had done no more than let it to the purchaser some months previously. It is very desirable that house-agents should understand that they cannot claim commission unless it is clearly shown that there is a contract between them and the house-owner, and that the agreement with the hirer or buyer, as the case may be, has been directly caused by their work and labour. It is, therefore, clear that if a mortgagee wishes to safeguard himself he, as well as the mortgagor, must enter into a contract with the surveyor to give certificates, so as to bring into existence a contractual relation. Then, if the surveyor does not perform his duty he is liable to pay damages.

THE case of Dennis *v.* Gould is, perhaps, one of greater interest to readers of the *Builder*. Mr. Justice Wills says that similar cases must have occurred over and over again, but we should hope that this is a judicial exaggeration. The plaintiff was a mortgagee, and advanced money to the mortgagor on the security of certain houses in course of erection. The money was advanced on the certificates of Gould, a surveyor at Ilfracombe. Some of the work was imperfectly performed, and thus caused a loss to the plaintiff, who thereupon sued Gould for the damages. The Official Referee, before whom the case was originally tried, found, as a fact, that Gould had been guilty of gross negligence, but not of fraud. Then the question came before the Queen's Bench Division whether, under such circumstances, the plaintiff had any legal ground of action against Gould. The Court had no difficulty in finding that he had none. There was no contract between Gould and the plaintiff, and there was no fraud on the part of the latter; if there had been, the action would have been attainable. This seems rather hard on the lender, who, in addition to having lost some money, was, of course, saddled with the costs of the litigation.

WE have received several of the Parochial Annual Reports which are usually issued about this time of the year. From that of the parish of St. Luke we learn that the question of constant water-supply for all houses in the parish has been before the authorities, and application made to the County Council to call on the New River Company to give a constant supply, with the result of a reply from the Council stating that they would make every endeavour to get the constant system extended to the parish with as little delay as possible. Other Vestries would do well and would be acting in the interests of the general public as well as their own if they would follow this example, and agitate for constant water-supply where it does not already exist. The report states that the system of emptying the sewer gullies by night has been found advantageous as avoiding public nuisance. The Chelsea Vestry report is, as usual, a very well drawn up and very full one. Among other points named is that of the smells arising from the main line sewer, in regard to which the Vestry have several times applied to the County Council, and the latter made a connection between the sewer and the boilers at the Western Pumping Station at Grosvenor-road, "by which it was hoped that the gases would be drawn out of the sewer and burned in the flues." Subsequently Mr. Æneas Smith informed the Vestry that he intended to carry pipes up his new buildings on the plot of land on the Chelsea side of Battersea Bridge, which he hoped would, in conjunction with the pumping station, effectually free Cheyne-walk from smells. We shall look in next year's report for the result of these efforts. In the Report to the Kensington Vestry by Mr. Weaver, the Surveyor, there is reference to serious complaints about drain smells in the north district of the parish:

"Occasionally, the smell was so alarming, that persons were afraid to light the gas burners in their houses, under the idea that the gas was escaping in their premises from damaged pipes. As the result of investigations above ground and in the sewers, the nuisance was found to arise at the works of the Great Western Railway Company, by Wormwood Scrubbs. At this spot the said Company manufacture compressed oil gas, and the waste water and surface drainage from the works found its way into the drain from the premises, running under the Great Western Railway, running eastward under the Gas Light and Coke Company's land, and thence into the head of the main middle level sewer to the west of Edinburgh-road. So pungent and offensive was the smell arising from this contaminated water, that its passage through the middle-level sewer from the sewer's commencement as aforesaid, right through Notting-hill to the Bayswater-road, was sufficient to charge the whole atmosphere of the district. Upon the Great Western Railway Company being called upon to abate the nuisance, they expressed the utmost readiness to do anything to abolish the cause of complaint, and as the outcome of consideration and experiment, the drain from the works has been entirely severed from the outlet drain under the railway, and the whole of the drainage (which is free from soil) is run into two iron cylinders, each about 6 ft. diameter and 25 ft. long, sunk vertically and buried in the ground. The whole of the offensive water is intercepted in these iron catchpits, and from thence it is pumped up into an open iron gutter carried above the roofs of the workshops, and run into a large iron cistern, from whence it feeds the boilers for generating the steam for the engines on the works. There is every reason to expect that the works thus carried out at considerable expense will be the means of abolishing the great nuisance about which complaints in the north district of the parish have been rife for years."

We shall be glad also to know the result of this action. The collection and disposal of the refuse of the parish is becoming a matter of difficulty, and Mr. Weaver suggests that reorganisation will be necessary, on more economical lines. He points out that if individual care were exercised in keeping out of the dust-bin everything that could be inoffensively burnt in the house, about half the cost of the work would be saved to the Vestry. Mr. Robson's Engineer's and Surveyor's Report to the Willesden Local Board is very well drawn up. He insists strongly on the necessity for reform in the road maintenance of the district, but we regret to see that he recommends wood pavement so strongly. It is about the least sanitary pavement for town districts. The subject of trees overhanging the public roads is referred to as a new difficulty; the owners will not obey notices to trim them, and the Surveyor's department has been keeping them trimmed where most required, without any organised system. The sewers in the district are flushed twice weekly, and found perfectly free from deposit. Many other points connected with public health and convenience are touched upon in this report, which contains a great deal of information and suggestion put into a readable form. We have one or two other similar reports before us which we will return to.

A CORRESPONDENT sends us a cutting from a recent number of the *Halifax Courier*, referring to our comments the other day on advertising broadsheets from architects, apparently with some surprise at the rigour of our views. The Halifax journal wants to know what the *Builder* would say of "architects who are in the habit of receiving one and a-half per cent. upon contractors' estimates, of supplying a considerable portion of the apparatus, &c., through the wholesale firms for whom they are acting as agents, and from whom they undoubtedly obtain a very handsome commission." Most of our readers know pretty well what we should say, viz.: that such people were making money dishonestly, and that if they were members of the Institute of Architects, they would be liable to be struck off its list on such a ground. But we cannot say that we have any of the direct knowledge of such practices which the Halifax paper seems to be in possession of. We are told that there are architects who do this kind of thing, and it may be true; but they are a kind of architects with whom it has not been our misfortune to come into contact. Some light however is thrown on this pessimist creed of the Halifax editor by a report (from another journal) of a speech in the Town Council, a week or two later, on a question of the architect's commission for a fire brigade station. They had first written to the architect to know what his commission was, and he wrote back to say it was 5 per cent. The speaker continued—

"They wanted to know next what he charged the contractors, and they found that he charged them 1½ per cent. for bills of quantities, making 6½ per cent. The sub-committee found, also, that in one of the contractors' bills of quantities there was

quite a fourth of the material which the contractor did not supply. In other words, he had to allow 30*l.*, 40*l.*, or so on, *which the architect supplied, upon which the contractor had to pay the architect a commission of* 1½ *per cent.* Of course, this was added in every instance to the contractor's estimate to the Corporation, and the Corporation had to pay through the contractor. This system, he should say, was carried on, more or less, in every contractor's work. *He was not going to say how much the architect would receive from the tradesmen who had supplied material. It was certain, however, that he would not order goods to be supplied unless he had some commission on them.*"

The simplicity of this utter disbelief in the possibility of honourable conduct of business on the part of an architect is certainly amusing; but the fact that two Halifax papers within a few days contain an expression of the conviction that architects habitually get commissions from contractors and tradespeople seems to indicate that there are some architects in that neighbourhood who have furnished ground for this belief.

THE *Western Mail* of October 28 gives an account of a visit of inspection of the directors of the South Wales and West of England Girder Company to the new works at Cardiff. The object of the company is to import girders direct to Cardiff from the Continent, the steel girders used in Wales having hitherto been obtained through London firms acting as intermediaries between the Belgian manufacturers and the consumers. This is of course in a commercial sense a perfectly sound and reasonable undertaking. The objectionable point about it, to which we have before referred, is that several of the directors are architects, who have thus a commercial interest in specifying girders to be obtained through this company; that is to say, they have an interest in the materials to be used which is not necessarily the interest of their clients. None of the architects whose names appear in the printed list of directors are members of the Institute of Architects. Two of them are members of the "Society of Architects."

THE case of St. Giles's Church, Camberwell, forms rather a serious indictment against Caen stone, for the London atmosphere at all events. According to the appeal of the Vicar (in the *Times* of November 1), 4,000*l.* will have to be spent on the tower and spire of this church, erected not many years ago from the designs of Sir Gilbert Scott, in order to make them safe, on account of the extent to which the Caen stone has decayed during this limited period.

THE September number of "S. A. A. *Notes*," the publication of the Sydney Architectural Association, contains a paper by Mr. Maiden, Curator of the Technological Museum of Sydney, and Botanist to the Forests Department, on "Some of the pale hard-wood timbers of New South Wales." This paper contains the description, by an expert, of many of the hard-wood timber trees of New South Wales, which is of interest in itself, and may be of practical usefulness to English architects or builders who are desirous to make use of any of these woods.

THE tenth exhibition of the Institute of Painters in Oil Colours, opened this week, contains about the usual proportion of interesting work and of mere mediocrity, with a few rather exceptionally good pictures. Among these latter is Mr. Joseph Clark's "Golden Wedding" (80), an admirable study of character and personalities of every-day life, the head of the old lady, one of the "golden wedding" pair, alone having a certain elevation of character. Mr. Shannon's portrait of a little boy (97) with a black cat on his knee, is in his best style. The President appears with a new class of subject (for him) in "Approaching Michaelmas" (143), a small rich-toned picture of a white country cottage amid masses of foliage, with a few geese in the foreground; the work is so fine in feeling and colour that it is a pity it had not a less prosaic title. Mr. Hugh Carter's "Rest by the Way" (10) is a superior work of its class, more solidly painted than many of his, and with less of the reminiscence of Israels which used to pervade his pictures too much. We do not think Mr. T. B. Kennington does himself justice in such works as "Engaged" (370) and "The Marriage Column" (540), which are commonplace in sentiment (very unusual with this thoughtful painter) and rather *clinquant* in colour. Mr. Fulleylove has a fine architectural picture of "The Piazzetta Venice" (414), in which the architectural detail is admirably shown; and Mr. East sends a beautiful landscape "The Clairwin Valley" (513). Among works to be noted are "The Breezy Blue" (13) by Mr. R. W. Allan; "A Sussex Lane" (103) by Mr. Wimperis; "The Lotus Gatherers" (171) a beautiful litttle bit of colour, by Mr. A. Drummond; a lion (200) by Mr. Nettleship; "The Mill," (207), a clever little study of moonlight effect, by Mr. Philip Burne-Jones; "In the Shadow of the Great Pyramid" (291) by Mr. J. Farquharson; a very clever study of night effect, "Moonlight" (440), by Mr. A. Harrison; "Confirmation Day" (532), by Mr. A. Chevallier Taylor; and "The Birth of a Storm" (549), a beautiful little landscape composition by Mr. F. G. Cotman.

THE pictures by Hervier, a former member of the "Barbizon school" of painters, now collected at Messrs. Boussod & Valadon's in New Bond-street, are worth looking at, but we think they have been rather overrated by critics who wish to make up to the painter now for undue neglect during his life-time. There is a power in his landscapes, especially in the large one called "Old Oaks in the Forest of St. Germain," which has something of Constable about it; but for the most part his colouring is grim and unattractive, and his subjects not happily chosen; the effect of the collection as a whole is, in fact, rather depressing.

THE collection of water-colour drawings by the late Charles Robertson, at the Fine Art Society's Gallery, is well worth a visit; it is a large and varied collection, showing the great technical talent of the artist, but showing also his limitations in regard to human character and expression. The large drawing called "Loot" is an admirably-painted Eastern scene, but there is no interest or character in the figures except as parts of a composition. His "Poppies" is a splendid flower piece, giving the *thin* character of the flowers which is often overlooked in painting. Some of the mere studies, such as that of the camels in "Sketch in the Market, Tangiers," are of great interest; and there are many fine bits of landscape, notably "Moonrise," with the timbers of the old jetty winding out from the foreground, like the skeleton of some extinct animal.

MR. SAINTON'S silver-point drawings of "The Ballet and Fancy Subjects," at the Burlington Gallery in Old Bond-street, show admirable drawing and a great mastery of this method of execution. A few of the subjects are pretty, and there is a good little nude study, but for the majority we can only regret that so beautiful a form of art should be thrown away on subjects which are both ugly and vulgar.

WESLEYAN CHAPEL, STOURTON.—On the 22nd ult. a new Wesleyan Chapel was opened at Stourton, a village near Hunslet, on the outskirts of Leeds. The chapel has been built from plans prepared by Mr. Thomas Howdill, architect, Leeds. The building is of brick, with stone facings, and is in the Italian Renaissance style. Inside, at the end opposite the organ, is a gallery, lighted by semi-circular topped windows, with leaded lights. Behind the chapel are vestries connected with the old building. There is accommodation for between 500 and 600 persons in the chapel. The cost of the structure has been about 2,000*l.*

LETTER FROM PARIS.

THE State entrance of the Palais de l'Elysée—the usual residence of the head of the State, was, until recently, adorned with the imperial arms which, on the accession of Napoléon III., had replaced the fleur-de-lys of the house of Bourbon. This innovation has just been re-edited by the Direction des Bâtiments Civils, which has thought itself bound to replace the arms of the fallen dynasty by a cartouche bearing, in the middle of a decorative trophy, the monogram "R. F.," officially adopted by the Republican Government. One cannot too strongly protest against the puerile intolerance which thus attacks public monuments and effaces the traces impressed on them by history. Only fifteen years since, when Duc, the architect, replaced the bouquets of fleur-de-lys which formerly crowned the gilt pilasters of the grille of the Palais de Justice, the Municipal Council of Paris was indignant at the change, and for a long time refused, for this cause alone, to erect to the memory of the eminent artist the monument which Chapu was to have executed and which is still unfinished.

A page of history cannot be effaced, and the mutilation which a too zealous functionary has inflicted on M. Carnot's residence is as absurd as if one were to efface from the walls of the Louvre, or of Fontainebleau, the cipher of Henri II. and Diane de Poitiers. Besides, a mere monogram has no heraldic signification, and considerations of decorative art demand something better. A distinguished architect, M. Boileau, has just addressed to a Parisian journal a very sensible letter on the subject, in which he observes that a modern artist, M. Coquart, has invented, in the new chamber of the Cour de Cassation, just the device that was wanted:—

"Le plafond, un véritable chef-d'œuvre moderne du genre, s'appuie à cet endroit, sur une corniche très puissante. L'Architecte l'a relevée par un décor triomphal extrêmement important où se résume le chiffre de notre Gouvernemente. De vrais drapeaux tricolores, en soie frangée d'or, habilement drapés, emergent des rondes bosses et forment comme une gloire autour des enfants, des faisceaux, des tables, des branches de chêne et de lauriers. C'est d'un merveilleux effet et d'une ampleur incomparable. Or (conclut M. Boileau), alors que, dans des édifices construits sous notre république, des architectes, plus inspirés sous d'autres régimes, ont à peine indiqué, n'importe où, un R. F. peu compromettant, un homme d'un talent hors de pair met tout son cœur d'artiste a créer des armes splendides pour le Gouvernement dont il est l architecte et . . . . . on le révoque sous prétexte qu'il a mis trop longtemps à terminer son œuvre!"

This is the fact, and it is worth putting on record as an instance of the despotic behaviour of the last Minister of Public Works towards M. Coquart, who has carried with him into his retreat the esteem and regret of the whole artistic world of Paris.

The Parisian press is also much occupied with the proposal to transfer to the Panthéon the remains of Renan, Michelet, Edgar Quinet, Arago, Lamartine, Ingres, Meissonier, and Thiers. In regard to this last, there will be difficulty, for the extreme Left will hardly pardon the man who put down the Commune; and on the other hand his representatives refuse to abandon the tomb in Père Lachaise. M. Léon Say, the author of the proposal submitted to Parliament, maintains that all objections may be provided for by erecting in the Panthéon commemorative monuments which need not be in the nature of tombs. In this manner, instead of depositing the remains of eminent men in a dark and damp vault, we might have, in the temple itself, an assemblage of memorial statues recalling the celebrities of past times. This would be a solution, but it is not a very possible one in a building the walls of which are already lined with paintings executed by the masters of the modern school. They talk much of making the Panthéon "the Westminster Abbey of France"; but to do that one would have to lay aside political fanaticism, and, here as in London, to have a building dedicated to the whole past history of the nation; and there is much to be altered before such an idea as that can be realised!

The first competition for the decoration of the salons adjoining the Salle des Fêtes of the Hôtel de Ville has just been decided. Fifty competitors responded to the invitation of the administration, but nothing very extraordinary has been produced. People are getting tired of these competitions, and it must be admitted that the recent results from them have not been very fortunate. In the present case six artists have

been chosen, three for each salon. They are MM. Bonis & Mouré, Danger, Delame, Jules Ferry, Henri Martin, and Bigaux & Simas. They are to send in next April portions of their designs full size, after which the final decision will be made. The second competition for the decoration of the Mairie of Montreuil will de decided shortly. The three competitors are MM. Bourgonnier, Gorguet (in collaboration with M. Courtois) and Henri Martin.

Another project to be submitted shortly to the Municipal Council is that for the decoration of the Mairie of the twelfth arrondissement, which, according to the scheme of the architect, M. Auburtin, will include four large panels of historical painting, and a marble bust of the Republic, which latter will probably be entrusted to M. Ernest Barrias. It is to be hoped that in this case the artists will be required to execute the work *in situ*, to avoid the disappointments which have been encountered in the Hôtel de Ville when paintings executed in the studios have been fixed in their place.

Both at the Hôtel de Ville and in Parliament much talk is being made about the sanitation of Paris, which has been gravely compromised by the system of "tout à l'égout." This system, laid out by the late Durand Claye, is worse for the suburban districts than for Paris proper, where the Seine water is but rarely employed for cooking or drinking, and where the addition of the water from the sources of the Avre and the Vigne will furnish an addition of 100,000 cubic mètres annually. The question, long discussed, has been again adjourned, for a month, by the Municipal Council, in order to allow time for the Administration to formulate a new scheme for obtaining a further water supply from Loing and Lanain. At the same time the scheme will be considered of an aqueduct starting from the plain of Achères, beyond St. Germain, to take the sewage not *to* the sea, as has been many times demanded, but *towards* the sea, and to utilise it for agricultural purposes on the lands along the route.

It is proposed also, for providing for the more sanitary condition of Paris, to constitute, in regard to dwellings, that which already exists in regard to individuals in the records of the "Casier Judiciaire." The "Casier Sanitaire" will include a sketch and description of each house, a record of population and sanitary condition, an abstract of the operations of disinfection carried out, information in regard to the systems of removal of house refuse, as well as in reference to lodgings recognised as insanitary, and records of any scientific investigations or sanitary inquiries specially made. The system of inquiry instituted by Dr. Martin will apply to 80,000 habitations in Paris, and will necessitate an expenditure of 70,000 francs in organisation.

The clearing out of the neighbourhood of the Palais Royal is a project which is partially of a sanitary nature, and which is again under discussion. The Banque de France wishes to acquire, for the purpose of enlarging its establishment, all the houses comprised between Rue Bailiff and Rue des Petits Champs. This operation will include the suppression of the Rue Radziwill, and a fine terrace, with steps for access to it, will replace the houses which border the Rues Beaujolais and Petits Champs, so that the north face of the Palace, facing the National Library aud the Rue Vivienne, will be completely opened out.

The work at the Musée Galliera will shortly be resumed, when the decoration of the interior will be commenced. It is hoped that the building will be ready for opening by the end of 1893.

The statue of Beaumarchais executed by M. Clausade (whose design was selected in public competition), is nearly completed, and will be shortly put up in its intended place at the angle of Rue St. Antoine and Rue des Tournelles.

We have already spoken of the proposals of the Government in regard to a great exhibition in 1900. To the schemes already formulated has just been added one by M. Saint-Lanne, who proposes to take the Seine as his basis of operations, and to establish on it a bridge-terrace of vast proportions, the four towers of which are to light the whole exhibition. The author of this proposal, which we mention merely as a curiosity, proposes also to annex for the purposes of the exhibition all the military zone between the Porte d'Auteuil and the river, and to transform the fosse of the fortifications into a canal with an electric railway on each bank. The whole scheme will include a superficial area of 165 hectares, a third more than the extent of the 1889 exhibition.

It is announced that M. Roujon, Director of Fine Arts, has proposed to the Minister of Public Instruction that all objects of art which are to be purchased by the State should be submitted to a new consulting committee. This committee would include not only the delegates of the Administration, but the best and most learned experts in the arts concerned, whose high standing and acquirements would give a kind of special recognition to objects purchased for the national museums. At the same time he would propose to send to special museums all objects of art or curiosities which did not come directly under the heads of painting, sculpture, or architecture. M. Roujon's proposal can only be commended, and it is to be wished that the Municipality of Paris would follow the same example, in which case less money would be sacrificed on mere bric-à-brac, and the public would not be imposed on with objects of but small artistic or historic value; such for instance as the portrait, by M. Yvon, of the little negress brought by Lieut. Mizon last summer from the banks of the Niger to Paris, and which has no interest in connexion with Parisian history. It has even been proposed to present to the Carnavalet Museum the marble table at which Ravachol lunched at Véry's restaurant, just before his arrest. Fortunately the Préfecture has refused to regard the Carnavalet Museum as an annexe of the Tussaud Gallery, and has declined the fantastic offering.

At the École des Beaux-Arts the jury has decided the first two prizes in the Jauvain-d'Attainville competition. That in the section of historical painting has been awarded to M. Guillemot, pupil of M. Cormon. The first prize in the landscape section has been awarded to M. Foreaux, pupil of MM. Harpignies, J. Lefebvre, and Olivier Merson.

There have been serious losses in the art world during the past month. To the names of Signol, Giraud, and Vital-Dubray, of whose death mention has been already made, we have now to add those of the landscape painters Lépine and Gosselin. Gabriel Vital-Dubray was born in 1813. A pupil of Ramey, he obtained a third medal in the Salon of 1844 for his "Joueur de Brottola." Among his numerous statues of celebrated persons we may remember especially the equestrian statue of Napoléon I. at Rouen, that of Jeanne Hachette at Beauvais, that of the Empress Josephine, formerly in the avenue of that name and now in the museum of Auteuil, those of Clodion, Sully, and Marshal Lannes, and the monument to Perdonnet, the engineer, in the cemetery of Père Lachaise. Vital-Dubray was Chevalier of the Legion of Honour since 1857, and was promoted to the title of "officier" in 1864. During the Franco-German war he was mentioned in orders of the day for the army for his brave conduct at the battle of Buzenval.

M. Stanislas Lépine, who died from an attack of paralysis at the age of fifty-seven, was a pupil of Corot, and exhibited regularly at the Salon, since 1859, Parisian landscapes on the banks of the Seine, painted with a rapid and firm hand. He excelled in representing the delicate grey and misty effects of morning. Among his pictures of this kind were the "Pont d' Iena," the "Pont Marie," the "Canal de la Villette," the "Pont des Arts," the "Jardin des Tuileries," the "Marché aux Pommes" (which gained him a third medal in the Salon of 1889), and lastly the "Pont Royal" and the "Pont de l'Estacade," for which he received a gold medal in the 1889 exhibition. Some months before his death he had finished a view of the Seine at the Pont Neuf, for the Salon des Sciences at the Hôtel de Ville.

It was also for the Hôtel de Ville that Charles Gosselin executed one of his last works, "Les Tanneries de la Bièvre," which decorates the side gallery of the grand staircase; a work, it must be admitted, much inferior to most of his former productions. He was born in 1834, and studied with Gleyre and Charles Busson. He began exhibiting in 1863. His manner of painting was careful and life-like to nature, which he observed attentively, and his pictures were full of a charming simplicity and truth. He excelled in autumn scenes. The valleys of the Jura, the plains of Picardy, and, latterly, the woods of Versailles have been some of his favourite subjects. In 1882 he was nominated Curator of the Versailles Museum, and President of the "Société des Amis des Arts" of Seine-et-Oise. In this double function he was much appreciated for his administrative qualities and kindliness of disposition. Charles Gosselin received medals in 1865 and 1870, a second medal in 1874, and the Cross of the Legion of Honour in 1878.

The Paris journals have announced the sudden death of M. Alfred Michiels, at the age of seventy-nine. He was librarian of the École des Beaux-Arts, and a distinguished art critic. He leaves a considerable amount of literary work behind him. We may notice amongst his principal works "L'Art Flamand dans l'Est et le Midi de la France," "L'Architecture et la Peinture en Europe depuis le Ve Siècle jusqu' à la fin de XVI.," and also "L'Histoire de la Peinture Flamande." M. Michiels was a learned and indefatigable worker, whose loss will be much felt in the world of art and literature. We have heard at the last moment of the death of M. Pouget, former pupil of Questel, who began early in life with some important works. He has died at the age of forty-three. He had been a member of the Société Centrale des Architectes since 1890.

MISS PENROSE'S LECTURES.

THE short course of lectures on Greek vases at the British Museum, which Miss Emily Penrose (daughter of the eminent architect) has just brought to a close, is noticeable more especially for the attention paid throughout to details of *technique*. We have heard much of late of the more popular side of the subject, mythography, and there was ample room for this new departure. We may say at once that Miss Penrose is very happy in her combination of simplicity and intelligibility of presentment, with a scientific attention to fact. Starting with the definition of man as "an animal that cooks its food," the first lecture dealt with ceramic imitations of skins, gourds, baskets, and the survivals of these several forms were clearly illustrated. The use of the potter's wheel was explained, and some comparisons instituted between modern and ancient potteries; the processes of drying, painting, and firing followed. The earliest specimens of archaic vases were then classified as follows: Primitive, Mycenæ, Geometric, Transition (including the vases of Phaleron, Rhodes, and specimens from Naukratis), Oriental. The second lecture dealt with the shapes and uses of vases, and here a word more might have been added as to the relation between use and shape. The amphora, being a vase for storing, is distinguished not only by its two handles, but by the narrowing of its neck; the krater opens out bell-shaped for convenience of stirring and mixing; the oinochoë is broad-necked for wine-pouring; the lekythos narrow for the dropping of oil. Passing to the black-figured style, the lecturer noted the different manner of applying white in the Primitive and Black-figured period, and showed how the gradual development of the Black-figured style was marked by the abandonment of the rosette, the modification of the frieze system, the introduction of inscriptions, and,—as regards subject,—the gradually increasing prevalence of mythology. Many of these points were illustrated by a full examination of a portion of the famous François ware. The transition from the Black to the Red-figured style was effected by the group of painters who centre round Epiktetos, and probably the first Red-figured decoration is to be found in the Gorgoneians that decorate the interior of early cylikes.

The cylix, in fact, as someone has well observed, sprang from being the Cinderella of the Black-figured period to the Princess of the Red; but the decoration of its interior presented difficulties long apparently insurmountable. The artist at first only transplanted the panel designs of his Black-figured amphoræ to the sides of the cylix, filling up the vacant space with first a palmetto, then a huge eye, or a siren or a sphinx; a little later a winged horse, then a horseman mounted, and finally the horseman becomes incorporated in the design which spreads uniformly over the whole space. As to the rendering of detail, incised lines quickly disappear; Euphronios, *e.g.*, an early master, rarely uses them; colour is eliminated, and by degrees the eye, once sharply differentiated for man and woman, is rendered alike for both, and gradually drawn correctly in profile. A further note of date is the treatment of the eye-lash. Still more stress was laid on drapery

as a means for chronology. At first, the chiton appeared solid and sheath-like, in Noah's-Ark fashion, taking no cognisance of the form beneath. Then, by the time of Euphronios, the limbs are drawn in, and show through the drapery, though still without governing its folds. The Doric chiton went in and out of fashion more than once, and its presence should always be noted as a mark of time. Attitude, again, is very characteristic of different periods: first, we have front-facing figures, with profile feet, their figures balanced on both feet; next, on one, the supporting foot being frontways, the other sideways, then precisely the reverse. In this respect vases follow the fashions of sculpture.

As to subject, fashion varies considerably. The mature Black-figured style adopts, in the main, subjects that are mythological. Epiktetos and his set love to depict daily life. With the early Red-figured style, Athenian mythology comes to the fore, and Theseus supplants Herakles. History is not without its influence. In 460 B.C. a colony in the Strymon is sacked by the Thracians; immediately after we have an outbreak of vases representing the slaying of Orpheus by the Thracian women. In the fourth century the Thebans shake off the tyranny of Sparta, and they see the mythological prototype of their own victory in Herakles strangling the snakes,—a subject which crops up suddenly on coins and vases.

With Brygos, of whose work the British Museum possesses a splendid specimen, the glory of Red-figured vase-painting culminates and closes. Excessive ornament, reintroduction of the colours so successfully eliminated, figure in relief, minuteness and excessive detail, attempts at perspective, are all so many downward steps. Odd though it may seem, the decline is traceable to the great masters, Polygnotus, Mikon, and the like, whose masterpieces in fresco seem to have intoxicated vase-painters and led them to forget the limitations of their handicraft. Miss Penrose closed a very instructive course, listened to with obvious interest, by a brief notice of the new Branteghem vases, *à propos* of white-ground style, and of the Græco-Italian schools. Each lecture was supplemented by a demonstration in the vase-galleries.

THE ROYAL COMMISSION ON METROPOLITAN WATER SUPPLY.*

WE resume our report of the proceedings of this Commission.

The Kennet Reservoir Scheme.†

In his examination as to this scheme, Professor H. Robinson said that continued communication between one side of the valley and the other is provided for by means of a roadway on the embankment which separates the lower from the upper reservoir. He adopted 600,000,000 gallons a day as a convenient figure, because the reservoir would provide the necessary storage to give that amount. Then, said Sir G. Bruce, it was rather the capacity of the reservoir that was indicated by the figures than the needs of London? The Professor put it this way, that the provision for a future population of 10,000,000, which would be afforded by the reservoir, seemed to meet the condition of things that could be reasonably contemplated by the Commission. He did not mean to say it was necessary that 300,000,000 gallons should go over Teddington weir; and, if that quantity were not deemed to be required, there would be more left for the population. About five-sixths of the 350 square miles of gathering ground was pervious material, such as chalk. The bulk of the water in the Kennet was derived from the chalk by means of springs; and a rainfall of 30 in. would give 10 in. available for the reservoir. Sir G. Bruce remarked that nothing like that had been stated to the Commission, who had heard of 4 in., or 6 in. at the outside, and he wanted to know whether the river had been gauged. No, it had not; but other streams gave records of 9, 9·61, and 8·8 in., with smaller rainfalls. Asked whether the water falling upon the five-sixths of surface that was chalk might not pass away without coming into the reservoir at all, he said the configuration of the ground showed that the great bulk of the water falling upon that area would gravitate to the centre; and the river itself ran over impermeable strata. The sections of the wells showed the line of saturation clearly, and indicated that the water falling upon that area would be thrown into the valley. It was quite clear to him that 10 in. out of the 30 in. would be received by the Kennet; and, if 10 in. were considered too high an estimate, it was only one-fifth of that 10 in. that would really be required. In the sections put in he had given so much detail that he thought he had shown conclusively the Kennet Valley would be, or would be made, perfectly water-tight. The puddle tunnel need not be continued more than two miles out of seven on one side, because all that had to be done was to bring the hydraulic gradient down to a certain point,—10 ft. in the mile,—so that the water could not travel. It would be seven miles to where the mottled clay came up to the top water-level, but a hydraulic gradient of 10 ft. in the mile only would prevent the leaking of any water through this pervious stratum. Throughout the district generally the hydraulic gradient is from 15 ft. to 30 ft. and 40 ft. in the mile; but where it is only 15 ft., a very slight amount of water is yielded by this thin layer. If it were brought down to 10 ft., no water would travel at all, and what tendency there was for it to travel through the thin bed would be diminished slowly by the closing up of the pores in the thin layer. By putting in the tunnel for the short distance, and by reducing the hydraulic gradient to 10 ft. in the mile, the possibility of the travel of the water through that pervious bed was reduced to a minimum; in fact, it vanished. Of course, said Mr. Hill, the longer distance you give the water to travel, the more chance there is that it will not escape; but what would the puddle-tunnel be? Well, it would be a drift about 20 ft. high by 8 ft. wide, worked by shafts from the surface and filled with puddle. But would not that settle and allow the water to pass? That would have to be provided against; it would be a work of time and care. Would not an open cutting be better? In some places it might, but at others shafts and a tunnel would be better. What if the mottled bed of clay did not extend over the whole area? Well, he relied upon that mottled bed of clay; if it was not continuous you got to the chalk; but the great object of his elaborate investigations and sections was to make certain, and to show that the mottled clay does extend over the area. If it did not he should not believe in making a reservoir there. By well-sections and surface indications the position of the mottled clay was determined and defined beyond possibility of question; that was the opinion of the geologists who were re-mapping the area for the Geological Survey; and he had got a plan which showed the re-mapping of the valley. There were a great many wells, and in one at Thatcham Vicarage the water stands higher than in the Kennet at Newbury. This shows that the water is passing from the chalk area to the Kennet, and not flowing in any other direction. Would not a large part of the reservoir be very shallow? No; on the contrary, what makes the valley exceptionally favourable for the purpose is that the London clay on both sides rises very steeply. He had made an examination of the area of the Thames, with the view of finding a site for a reservoir, and, although there were many possible sites, there was no site, in his opinion, equal to the Kennet Valley, because it had such steep sides, and so small an area of land would be uncovered by a fall in the water level. The contours, said Mr. Hill, seemed to indicate a shallow area? But that is the upper reservoir, which is always to be kept filled, and only drawn upon in times of drought. In the lower part of the valley, from which abstractions would be made, you have the steep sides. The information that the London clay had been incorrectly mapped, and that there was to be a correction of the Geological Survey, he had obtained from Mr. Blake, the Government geologist stationed at Reading. Asked by Sir A. Geikie to indicate on the sections the nature of the information and the data for the correction of the Survey, he said that one section was to be taken with another. On section 7 the position of the mottled clay was fixed by the Aldermaston Brewery well.

Sir A. Geikie: That is the only well on the section, and the only well on section 3.

Witness: That is the most important well.

Sir A. Geikie: But you have no other evidence for your section except that well?

Witness: Not on that point.

Sir A. Geikie: No, nor at any point of that section along the part covered by the reservoir.

Witness: No, not at that point.

It was not one fact, he afterwards explained, but many facts put together, that led to the better determination of the position of the London clay. There were data covering a large area of the ground, and the sections plotted together told the story completely. The witness having illustrated this and mentioned the Woolwich Farm well,

Sir A. Geikie said: I do not know, but it appears to me now that the evidence you have is not quite sufficient for the drawing of accurate sections. That is the impression that it makes upon my mind. I think it is quite true Mr. Blake is right in the correcting of the original map of the Survey, and I think that one well itself would show that there was probably some error, though I doubt very much whether the evidence of your sections is entirely to be relied upon.

Witness: I am sorry to hear you say that. Mr. Blake has authorised me to say that he has relied on these sections, and that they have materially assisted him in mapping out the district. If ever there was a case in which an enormous mass of information was available to determine accurately the position of strata, these sections furnish it. All the geologists in the neighbourhood consider it mapped out accurately.

Sir A. Geikie: It is one thing to trace a boundary line in a valley obscured by alluvium, and another thing to make a reservoir. I accept what is said by Mr. Blake and yourself, but I would like to get something beyond as to the floor of the valley being clay.

Witness: Quite so, and it is for that reason these sections have been lithographed.

Sir A. Geikie: But could you not put the data on them?

Witness: The difficulty is to do it intelligibly. The original plans and sections at my chambers would only be confusing. I have given all the material facts.

The witness added that he believed, from all the information he had obtained from geologists, that the mottled clay might be regarded in that district as unquestionably impervious throughout. He only mentioned the possible supplemental supply from Hampshire and Wiltshire in case it should be deemed necessary to provide for a larger population than 10,000,000, or to give a larger supply per head than 30 gallons.

The Nine Reservoirs Scheme.

In order that the nine reservoirs proposed by Messrs. Marten & Rofe may be referred to by numbers, it is necessary to remind our readers that the following are their names or localities: 1. River Windrush, above Burford. 2. Sherborne stream, above junction with Windrush. 3. River Cherwell near Moreton Pinkney. 4. Sor Brook, Broughton, near Banbury. 5. River Swere, near Adderbury. 6. Stream near Deddington. 7. River Dorne, near Woodstock. 8. River Glyme, above Woodstock. 9. Thame, at Hardwick, near Aylesbury. Details of these nine reservoirs were given on page 318 of the *Builder* of October 22.

Mr. Henry John Marten and Mr. Henry Rofe were both examined upon their joint scheme.

Mr. Marten's Evidence.

Mr. Marten said that the instructions given to him on behalf of the Conservators of the Thames were to consider whether by storage reservoirs he could augment the flow of the river so as to allow the companies to double their abstractions without reducing the dry-weather flow at Teddington below 200,000,000 gallons. That might be taken as the minimum flow, on a few days of rare heat and drought, above the quantity appropriated by the companies, whose maximum had been 107,000,000. The general conclusion come to from the data available was that another 107,000,000 would last about forty years. Then, deeming it probable that the Thames Valley would supply that additional quantity, he and Mr. Rofe, assisted by Dr. Henry and Mr. Horace Woodward, looked to see where the water could be stored and paid out at the right time. They also consulted Mr. Topley and Mr. Boyd Dawkins, and concluded that it was feasible to make the nine proposed reservoirs and others. They endeavoured to avoid railways, canals, and occupied valleys, and to divide the storage so as to avoid inconvenience from the repairs of one large reservoir.

* For reports of previous sittings of the Commission, see last volume of the *Builder*, pp. 418, 435, 456, 480, 503; and current volume, pp. 10, 29, 47, 71, 82, 103, 126, 298, 316, 338.

† See *Builder* for October 22, p. 316.

From particulars furnished by the Board of Agriculture, he found that the population above these reservoirs would be about 1 person to 5 acres. Of the gathering ground 56 per cent. was arable and 44 per cent. pasture. There was rather less than one animal to an acre. The population was rather decreasing, and a good deal of the land was going into pasture. The reservoirs would be good in themselves; but there might be some doubt about Nos. 7 and 8 on the Dorne and the Glyme. That is all in the Upper Oolite; but they went into those valleys because in Blenheim Park there is a reservoir of 130 acres, which is a fairly tight one. The rocks which would form the sides of the proposed reservoirs contain about 25 per cent. of marl and clay measures in thinnish bands. Some of the reservoirs would be at such an elevation that it would be possible to send the water down to the metropolis without pumping; but that question was not included in the reference. Pumping might be saved, but, on the other hand, there would be the cost of pipes, and the cost of pumping was being reduced nearly every day.

The Chairman: The idea of sending water down the open channel would appeal rather more to the Conservancy than to the consumer.

Mr. Marten: There are thirty-eight weirs and water-wheels above the intakes. These have an average fall of 4 ft. 10 in., and they produce an immense amount of aëration. If I understand Dr. Frankland's evidence, the water is not deteriorated in the river, and it is better at the intakes than at any other part of the river.

The Chairman: Would it be better at the intakes than when stored in the reservoir?

Mr. Marten: It would there be an improving water. To a very large extent it would be flood water loaded with a certain amount of alluvial matter, and that would settle, and, in settling, get rid of other things. So the water would be quite equal to if not better than the average of the water coming down the river ordinarily. The water from the reservoirs would materially improve the water affected by sewage.

The Chairman: Would the water in the reservoirs be such that it would be improved by going down the Thames in its present condition and would it be delivered in a better condition than if it went down in a pipe?

Mr. Marten: Aëration is of great value, and you could not get aëration in pipes; but of course there would be no contamination in the pipes.

Sir G. Bruce: The strata forming the bed of these reservoirs seem almost all to be pervious material. In the dam which holds up the water you have a puddle trench carried through the Oolite and through the Northampton Sand down into the Lias clay. What do you do about the water coming round about the side of the trench?

Mr. Marten: There would have to be wing trenches. They would vary in length with the site of the reservoir.

Mr. Hill: Do you think flood-water from a highly-cultivated district is desirable water to store?

Mr. Marten: There is no material reason why it should not be stored. This is not very highly-cultivated land, and the water from it goes into the river.

Mr. Hill: Yes; only flood-water is not taken.

Mr. Marten: The surface to a large extent is porous, and the water would not come off the surface of the land itself, but would be filtered through it.

Mr. Hill: Owing to that porosity do they not seem to be rather doubtful sites?

Mr. Marten: The only sites that are doubtful are the two I have named, and I believe that those would turn out satisfactorily.

A number of reservoirs can be made one at a time, each succeeding one with the benefit of the experience already gained, and therefore the scheme which he and Mr. Rofe had submitted to the Conservators might be called a progressive one. It was a programme for the future, not to be carried out all at once.

Mr. Mansergh: If you have within ten or twelve miles of a town known means of increasing your supply by degrees, you would not construct works for a longer period than twenty or twenty-five years? But if you have to go a very long distance, and make an expensive conduit, you would expect to secure a supply that would last a much longer time?

Mr. Marten: Yes; and that is the justification for the Liverpool, Manchester, Birmingham, and other big schemes. If those towns had only had a Thames by them, they would not have gone so far afield as they were obliged to do.

Mr. Mansergh: You would call these shaky sites, would you not, these two that you have doubts about? You would not gleefully begin to make them with a light heart?

Mr. Marten: Well, I should feel a certain amount of responsibility with regard to them, there is no doubt.

Mr. Mansergh: Not more than responsibility?

Mr. Marten: I felt a good deal more doubt when I had not the advantage of having a geologist with me than I do now, after taking a second view. The Blenheim lake makes me more favourable to those sites than I did at first.

Mr. Mansergh: You found an old dam 22 ft. high, with little bleedings; and you could not tell that these little streams were not coming out of the reservoir?

Mr. Marten: One of these springs, as they are called, is made use of for the supply of Woodstock. The water is pumped by a turbine, which is placed at the foot of the dam; the water from the lake falls over the turbine, and pumps the water of this spring to supply Woodstock; so that if there were leakage it is being utilised. I said, if this really unscientific little dam can do all this, why I think we ought to make reservoirs here too.

Mr. Mansergh: You heard Mr. Hawksley say he did not intend to take in flood-water?

Mr. Marten: I did not gather that. I should propose to take in flood-water.

Mr. Mansergh: You think there is no harm in taking it from large watersheds and sending it down the river?

Mr. Marten: No, I think not. In Gloucestershire there is a case where water is pumped out of an ironstone pit, and it is so full of sulphuretted hydrogen that you can hardly stand near it; but that is entirely got rid of by aëration, so that in the town not a tap has any smell of gas. I look upon aëration as of very great value indeed.

Professor Dewar: If you had to supply 200,000,000 gallons a day, could you find a watershed to supply it uninhabited by man or animals, or uncultivated?

Mr. Marten: Not in England.

Professor Dewar: The flood-water coming from the lower part of this valley I presume you regard as much more impure than the flood-water from the upper part?

Mr. Marten: Yes, certainly; there is no doubt about that.

Professor Dewar: How long would the water be stored before use?

Mr. Marten: It would be in process of storing for eight months of the year; and during storage the water would undergo an amount of natural purification.

Mr. Rofe's Evidence.

Mr. Henry Rofe explained some changes that had been thought desirable after the plans were sent to the Commissioners.

Sir G. Bruce: Supposing these sites or several of them were found to be objectionable on account of the strata upon which the water is to rest, are there any other sites which you have looked at where the same objection would not apply?

Mr. Rofe: There are none that I have looked into carefully, but it is obvious from the maps that there are many other sites on the clays where the objection would not apply.

Do you feel quite sure about that?—Quite clear about it.

As to flood-waters, he did not understand Mr. Hawksley would exclude them from storage reservoirs, but only from the water which he would pump into the Staines reservoir. If he were designing a scheme for London, which this did not pretend to be, he should consider carefully whether it would not be wiser, even if it were an extra cost, to put the water into pipes. The value of the dam in Blenheim Park was that it showed you could have stable works in foundations of this character. Asked whether there was not "a good deal of weeping," he said he should be inclined to put it higher than that, but if that unscientific dam would do there, any one who knew what he was about could put a much better and safer one there. The proposed dams would be higher, but would come down to the water-tight formation; and you can make practically water-tight reservoirs. A geological section showed rocks right up to daylight. The slopes of the Glyme and the Dorne were well grassed, and naturally puddled. The bottom was largely covered with an impervious material. He did not put these as ideal sites; they are not the best sites that could be found in the Thames Valley. The sections showed alluvial deposit, but even with this pervious material the water would be kept, because the puddle trench would go down to the impervious stratum, and the water was bound to be thrown out into the reservoir. The sections did show that in some cases it might travel laterally, but it would be a difficult thing for it to do, because even these oolites were mixed up with beds of marls to the extent of 25 per cent.

It was his experience that from 25 to 26 gallons per head per day was ample to provide for large communities, where there was an average trade consumption; but it was a different thing at Middlesbrough, where two-thirds of the consumption was for trade purposes.

Mr. Topley's Report on the Nine Reservoirs Scheme.

Mr. W. Topley, F.R.S., in a report to the Commission on this scheme of nine reservoirs, made the following remarks:—

No. 1. This reservoir will be mainly on Lower Lias clay with a perfectly water-tight bottom. The upper part of the sides, near the lower end, will be on Middle Lias, and, on eastern side, partly also on Upper Lias. The lower part of the Middle Lias is largely composed of sandy shales and clayey sands, and is, therefore, much less pervious than the upper part, which contains the Marlstone. By carrying the puddle-trench well into the hill on each side, and by making wing-trenches on the north-west and north-east sides of the two ends of the puddle-trench, the dam can be rendered perfectly water-tight.

No. 2. The site of this reservoir is on Inferior Oolite, and at first sight it seems a bad one, inasmuch as the Inferior Oolite is a porous rock. The soil on the hillside is rubbly, but is naturally puddled to some extent on the gentler slopes. No doubt there may be some difficulty and expense in making this reservoir and its dam water-tight; but a little consideration of the physical structure of the district will show that some leakage can do no harm. The water cannot get away to the west, as the lowest level of the Inferior Oolite in the Northleach valley is higher than the top water-level of the reservoir. It is not until we reach the Churn valley, near Rendcombe, that we have Inferior Oolite cropping out at the 500-ft. contour; this is more than three miles from the nearest point of the reservoir. If water gets away to the east, it will go partly into No. 1 Reservoir, partly into the stream above Sherborne. By measuring the compensation water half a mile below the dam, any water escaping could be utilised.

No. 3. This reservoir and dam will be on Middle Lias, the lower half of which is more or less impervious. On all sides, except at the valley where the dam will be placed, this Middle Lias is capped by the clay-beds of the Upper Lias, and the beds below the surface are not likely to be open and fissured. Water will, therefore, not have much freedom of passage. If wing-trenches be made, the reservoir can be rendered fairly water-tight. Here, also, escaping water can be measured below the dam for compensation. The estimated cost of this reservoir is low in proportion to its capacity; considerable expense can, therefore, well be incurred in making it water-tight.

No. 4. This reservoir will be mainly on the Lower Lias, and on the lower or clayey beds of the Middle Lias, only a small area near top-water touching the Marlstone. The extreme western end just touches the Inferior Oolite, where let down by a fault ranging south-west from Banbury. The dam will be carried down well into the Lower Lias clay. A wing-trench on the eastern side will probably prevent water escape in that direction. Any water so escaping will find its way into the Cherwell. There is not likely to be any escape to the south; if so, the water would pass into the next reservoir, No. 5.

No. 5. This reservoir is on Middle Lias, a small area being on Upper Lias. The parallel faults running east and west on each side of the valley have let the Middle Lias down into a trough, so that water tending to escape along the sides would be stopped at the faults by the impervious Lower Lias clay.

No. 6. This reservoir will be almost entirely on Lower Lias clay; it has, therefore, an impervious bottom. As originally proposed, the dam would have been on the south-east side of a fault, where the Great Oolite is brought down. The dam site has now been shifted a little to the north-west to avoid the Great Oolite. It will now be mainly on Lower Lias, only a small area on the south side of the fault being on Upper Lias. A wing-trench can be carried westwards from the dam on the south side; this will shut off all leakage.

I have no doubt that the whole of these reservoirs can be made practically water-tight, most of them absolutely so. The expense necessary for this will no doubt add slightly to the estimated cost in some cases.

In his examination by the Chairman, Mr. Topley said of the Windrush Valley reservoir that it had a perfectly water-tight bottom, and the dam would be mainly on Lower Lias. He did not see at all why it should not be absolutely water-tight. He could not conceive that there would be any objection to that reservoir, and it was the largest and most important of the nine; it was the best of the lot, and he did not wish his remarks to apply to all. Still, several of these were excellent sites.

Mr. Hill, quoting the description the witness had given of No. 2, that the soil was rubbly and naturally puddled on the gentler slopes, remarked that that was doubtful sort of matter where you had pervious material below; and the witness answered: Yes, it is. Of course, these reservoirs, when they are in use, will puddle themselves. There is a clayey soil, and a loamy soil over the slopes, and that would prevent the water getting in.

But when you are putting a depth of 40 ft. or 50 ft. of water it would make a very great difference?—Of course the tendency to force the water out is more.

You must not count upon it in the way you are doing to-day?—In my statement I have said there is a possibility of that reservoir not holding water perfectly, but if it leaks the water will partly flow into the basin of No. 1, and it will partly flow into the stream to the south, in which the compensation water can be measured, and you can measure the leakage as compensation water.

But that would not be very satisfactory, I think, in a reservoir?—Well, one would rather have a reservoir that would not leak at all.

Of course, in the bottom of the valley it would, as you say, choke itself?—Yes.

But on the sides where there is no deposit, no such process would go on?—No. Of course the choking would be more at the higher part of the reservoir, where the water comes in. It would extend over the bottom, but not so much at the sides.

In fact, the wash of the reservoir would clean away any deposit that there is on the side?—Yes; but then you see the possible leakage can be very largely guarded against by making wing trenches.

It is very uncertain to what extent you can put a wing trench all round a reservoir. To what extent would it have to be carried?—The further you take the wing up, the greater the distance the water would have to get round it, of course. Therefore, it has a greater difficulty in getting round.

It would probably leave some deposit on its way?—Yes; I do not reckon No. 2 reservoir as one of the best. As it has been cut down by some of the engineers to get over the difficulty, it is not really of very much value. It is tributary to No. 1.

As to No. 3, it is said the beds below the surface are "not likely" to be opened and fissured. How do we know that?—We know that rocks exposed to the surface are more open than when they are covered with thick beds of clay.

Yes, but there is great uncertainty?—There is an amount of uncertainty; but, being so thickly covered with impervious clay, I do not think that the fissures would be very open far underneath the clay, and, therefore, water will not have very much freedom of passage there.

These are very shallow reservoirs; the drawing down of the water in summer-time would leave large areas bare?—No doubt it will; and it is the intention not to do that. There is, of course, a great objection to any reservoir that is apt to be dry in summer. I have made notes as to the relative value of the reservoirs; I do not speak in the same terms of all. I suppose No. 1 is the best. I have not the slightest doubt that that can be made,—in fact, I cannot conceive why anyone should question it at all,—and also the Hardwick one (No. 9), which I saw after writing my statement. It is a very good one, indeed.

Messrs. Woodward's Report and Evidence.

Dr. Henry Woodward, F.R.S., F.G.S., and Mr. Horace B. Woodward, F.G.S., made a report in which they said:—

No. 1. This reservoir would be situated in a broad valley, almost entirely on the Lower Lias clay, the bordering hills being composed of Middle and Upper Lias, capped by inferior Oolites. The lower beds of Middle Lias form the floor of the reservoir at its southern end, and the upper beds of Middle Lias and Upper Lias clay flank the reservoir by the dam. The general dip is towards the south. The site is a most suitable one.

No. 2. This is a ramifying valley in the Inferior Oolite, with slopes capped in places by Fuller's earth, clay, and Inferior Oolite. The bordering rocks are of a porous nature, although the slopes are coated in places by earthy rubble. Owing to the south-westerly dip of the strata, water cannot freely escape on the east, but a certain amount may flow away to the south-west into the Windrush drainage.

No. 3. This reservoir would be situated in a forked valley, based on the upper beds of the Middle Lias (marlstone) with clay slopes formed of Upper Lias. Lower Lias clay underlies the area, the general dip being to the south-east. Here the bottom of the valley, and to a certain extent the slopes are coated with clayey material, and the marlstone itself is likely to be water-logged.

No. 4. The bed of this reservoir would be on Lower Lias clay, and the sides would be mainly on the lower beds of the Middle Lias. No escape of water is to be apprehended.

No. 5. This reservoir would be situated in a valley formed of Lower Lias clay, with a central faulted tract of Middle and Upper Lias. It would be practically water-tight.

No. 6. This would occupy a valley mainly in the Lower Lias clay, with a portion of Upper Lias clay brought in by a fault. Traces of Northampton sands would be touched, but all escape of water would be shut off by a wing-trench.

Nos. 7 and 8. These would be entirely in the Great Oolite, the bottoms of the valleys being, however, covered by alluvium. Here the Great Oolite contains a considerable proportion of clay or marl, amounting to 25 per cent. of its mass, and the gentler slopes of the valleys are covered by a rubbly clay that serves to render them practically water-tight. Here and there, where old quarries have been worked, the banks would require to be puddled.

No. 9. The reservoir would be situated entirely on Kimmeridge clay, with only thin patches here and there of alluvial gravel. It would be perfectly water-tight.

Dr. Henry Woodward, in his examination, said that he and Mr. Horace Woodward had examined the sites of the nine reservoirs to see whether they were geologically feasible. They came to the conclusion that No. 1 was the most important site, and of undoubted suitability, as it could be made perfectly water-tight. There are in the neighbourhood several sites on which artificial lakes have been constructed. One is the Woodstock reservoir, covering 130 acres, built between 1720 and 1750, by Launcelot Brown. The Great Oolite forms the sides, and the bottom is alluvium with a substratum of Upper Lias clay. Other lakes rest upon the same Oolite beds. These contain here a larger proportion of impervious material than in the Cirencester and Bath areas, and consist of marly beds between limestones. Judging by the large proportion of clay to limestone in the valleys, there are two suitable for reservoirs that can be made watertight,—the Dorne and the Glyme (Nos. 7 and 8). These sites, being in the Great Oolite, would not have been looked at if it had not been for the existence of the Blenheim lake. It seemed that there was a large proportion of clay in the soil all round the lake, and that the clayey character of the Oolites rendered it water-tight. The "rubbly clay" covering the sides of the valleys is the result of the disintegration of the Oolite beds which are associated largely in that area with clay beds and marly beds. Water pressing against the face of these hillsides would not be liable to pass away.

Mr. Horace B. Woodward, examined by Sir A. Geikie, said the Windrush Reservoir (No. 1) would practically be almost entirely on the Lower Lias clay. The dam would just touch the Upper Lias clay and the Middle Lias. The Lower Lias clay for 400 ft. is impervious, with an occasional nodule and band of limestone. The Middle Lias is very variable. In this area it is generally a thin rock bed, and underneath that thin sandy shales. Near Stroud the beds are used for brick-making. This is the only geological defect, and it can be remedied by wing trenches.

No. 2 reservoir has a floor of Inferior Oolite, partly limestone and partly sand, with an alluvial deposit in the bottom of the valley. The sides are partly coated by rubble, but will not be so water-tight as any of the others; the strata are really more porous. Rubble is the rock that crumbles away in fragments from the sides of the hills mixed with loam. It is generally found on the side of a quarry. Earth and stone get mixed with it, and, being washed down the side of a valley, form a protective coating. The lower slopes are, in many places, quite impervious. This rubble is certainly impervious, but the whole area may not be covered by it. A certain amount of water would be likely to escape through the Inferior Oolite, which is almost wholly limestone, but very porous in this particular part. The beds of limestone, from 6 in. to 2 ft. in thickness, are very porous and faulted. A certain amount of water would get away, and a certain amount would be retained, but he would not like to say what would be the relative proportions, so that his judgment on this site was not so favourable as on No. 1. The dip is so slight it would get away slowly, and a sufficient quantity would be retained to be of service.

No. 3, the witness said, is based mainly on the marlstone of the bordering hills and the Lias clay. The rocky bed would be 40 ft. thick, largely covered with alluvial coating, argillaceous, very impervious. The marlstone would be water-logged. The banks would be absolutely water-tight. In the Upper Lias there are a few nodules of limestone. If a bed is 135 ft. thick, there would be over 100 ft. of clay and shale, impervious even in the lower parts, because the marly limestone is interstratified with clay. No. 3 would be all right because, the marlstone being water-logged, water would not get very far to the south-east. There is no risk of the water percolating the parts not covered with the alluvial and getting into the marlstone because the clay is carried well down into the Lower Lias. It would be 65 ft. down to the Lower Lias, and a puddle trench would require to be 65 ft. or 70 ft. deep. There must be some fissures, because we get water from the marlstone. The strata are flat and undisturbed, and there are no faults of consequence.

No. 4, having a floor of Lias clay, with sides of Middle Lias, would be satisfactory, almost as much so as No. 1. Of course you have more of the loamy beds in the Middle Lias, but they cannot be very leaky.

In No. 5 there is a central platform of marlstone which lies between two walls of clay. It is a case of faulting. Any leakage is cut off by the walls of clay on either side, and these make the reservoir practically water-tight.

No. 6 has a faulty floor of Lower Lias clay and Upper Lias clay, which are brought together. The dam runs across to the Northampton sand, but the wing trench would cut it off. The Upper Lias consists of shales and impervious clay. This is a favourable site.

Nos. 7 and 8 lie in the great Oolite formation, 30 ft. of the upper part of which would be mainly very porous limestone. Beneath that alternate marl and limestone, inadequate to check water; but the reservoirs hardly touch these; they are mainly in the lower beds under these porous beds. The bottoms of the reservoirs would lie on the Great Oolite, floored with impervious alluvium. The rivers start up in the Upper Lias, and bring down blue mud which Mr. Marten has pointed out as useful in stopping any leakages in the reservoirs.

No. 9 is entirely in clay except for the possible trace of gravel. The clay merges into the Oxford clay, so that there are 500 or 600 feet of clay. There are no beds of alluvial gravel,—only little beds of gravel here and there. It is an absolutely water-tight site.

To Mr. Mansergh: In No. 3 the beds run fairly flat; the puddle-trench would have to be carried down nearly horizontal; and, presumably, it would have to go 140 ft. or 150 ft. deep in the shoulders.

To Mr. Hill: The information he had ob-

tained enabled him to form an opinion that the reservoirs would be retentive. The clay brought down makes the flood water turbid.

To the Chairman: The sites in themselves are good sites.

Professor Dawkins's Report and Evidence.

Professor W. Boyd Dawkins, F.R.S., in his report said:—

No. 1. This large reservoir is almost entirely on the impervious Lower Lias clay, the top water-line cutting to a small extent the Middle Lias and the Upper Lias clay. The puddle-trench has a perfectly good foundation in the Lower Lias clay. If there be leakage through the sandy beds of the Middle Lias, it can easily be stopped. It is, in my opinion, a very good site.

No. 2. This smaller reservoir is mainly on the Inferior Oolite, and the top water-line cuts the Midford sands and Fuller's earth. The puddle trench is to be carried down into the impervious Upper Lias clay. The leakage through the porous oolitic beds may be met by wing-trenches carried down also into the Upper Lias clay. The leakage on the east side will flow into No. 1 Reservoir. It may be made a useful auxiliary reservoir to No. 1.

No. 3. This reservoir, on the head-waters of the Cherwell, is wholly on the Middle Lias, which is partially covered by a surface wash of clay. The puddle-trench is to be carried down into the Lower Lias clay. If there be leakage it can be met by a wing-trench on the western side. On the east the covering of the Upper Lias clay shuts off the Middle Lias from the surface and renders leakage difficult if not impossible. The sandy beds of the Middle Lias are water-logged, and the Middle Lias at Edgecott, close by, is sufficiently water-tight to support a large pond.

Nos. 4, 5, and 6. These three reservoirs for the storage of the tributaries of the Cherwell are based on the Lower Lias clay, the top water-line cutting or touching the Middle Lias in all. In No. 4 the puddle-trench is to be based on the lower lias clay. To prevent leakage, if necessary, a wing-trench can be made on the east side. In Nos. 5 and 6 the puddle-trench is to be carried down into the impervious Upper and Lower Lias clays, which are here faulted together. There is no chance of leakage because the valleys in which the reservoirs are to be placed are in faulted troughs bounded by the Lower Lias clay.

Nos. 7 and 8.—The reservoirs 7 and 8 are wholly on the great Oolite strata, consisting of massive pervious limestone and subordinate layers of marl, and with their outcrop at the surface largely covered by a clayey sub-soil. They are water-logged in the valley bottoms. The question as to whether reservoirs in the rocks can be made sufficiently watertight for storage purposes is conclusively answered in the affirmative by the practical experience of the great lake in Blenheim Park. The puddle trench in both these cases will be carried down, if necessary, into the Upper Lias clay. It is very likely, however, that a layer of marl sufficiently thick and watertight may be met with in the Oolites which will render this unnecessary.

No. 9. This reservoir is wholly on the impervious Kimeridge clay, here covered with a thick and irregular coating of sand and loam.

Conclusion.—All these sites are practicable for the storage of the flood-waters, and the equalising of the flow of the Thames. They present no exceptional engineering difficulties. They are the only sites to which my attention has been directed. There are probably many other sites as good or better in the Valley of the Thames, which may be utilised in a similar way for increasing the water in the Thames available for the further supply of the metropolis.

In his examination, Profession Boyd Dawkins said that he was well acquainted with the district of the proposed reservoirs, and for this special purpose he had spent three or four days there. The reservoirs were the best that could be made under the difficult circumstances of the Upper Thames, and some of them seemed to be perfectly good and watertight reservoirs. No. 1 is a most excellent reservoir; it is a large one; the bottom is a perfectly good foundation; and there would not be very much difficulty from leakage. It would be shallow for a long distance in the upper part. The Lower Lias clay is an excellent, impervious foundation. How long the wing-trenches would require to be is a matter for experiment. No. 2 would not be a water-tight reservoir, but the leakage through the porous Oolite beds may be met by wing-trenches. On the eastern side any leakage would flow into No. 1, and would not do any practical mischief. It is very probable the flow of the water would be arrested sufficiently to allow of No. 2 remaining full, but as to making it absolutely water-tight he doubted whether that could be done. No. 3 may be made a fairly good working reservoir. He saw no difficulty in making it water-tight. If the leakage proves to be considerable, he does not see why it should not be met by wing trenches. Looking at the condition of the rocks there which are water-logged, and at the fact that there is a large pool on those very rocks not far off, he could not anticipate that long wing-trenches would be required, or that it might be necessary to surround the whole reservoir with a puddled trench. Nos. 7 and 8 look extremely doubtful from the map, and the known geological chamber of the oolites, but there is every reason to suppose that these reservoirs can be made to be hold water at all events as well as the lake in Blenheim Park. That is very shallow in the upper part, but the lower part reaches a depth of 30 ft. If the head of water in the proposed reservoirs would be greater, so are the methods of dealing with it better than when that lake was made. No. 4 might be made to hold water. Asked to reconcile the statements of Mr. Woodward and Professor Green, he pointed to the map which showed the Lower Lias at the bottom, and said there could be no doubt that the foundation was Lower Lias clay. Nos. 5 and 6 may be made as nearly as possible absolutely watertight as any reservoir can be made. Professor Green's and Messrs. Woodward's opinions being read to him, the witness said the view of the latter was the accurate reading of the facts. No. 9, being wholly on the impervious Kimmeridge clay, there could be no doubt about it being a perfectly tight reservoir. His attention had been called to the reservoirs, and he did not wish it to be inferred that he had minutely examined the area of the Upper Thames, and that these were the only sites which he ventured to have an opinion upon.

The Commission stands adjourned to the 15th inst. Meantime, we have in type, and hold over for the present, the report and evidence given by Professor A. H. Green, F.R.S., on the "Nine Reservoirs Scheme," together with evidence given by Mr Topley as to additional sites for storage reservoirs and as to a somewhat curious proposal by him for "slowly-leaking" reservoirs (with the view of compensating the land springs), and evidence by Sir Frederick Bramwell on chalk supplies.

Illustrations.

TRURO CATHEDRAL.*

THE Cathedral stands in the middle of the city, and as seen from the river it is a very striking object, towering up above the houses on all sides in the centre of the valley or basin in which the city is built.

It occupies the site of the ancient parish church, and spreads out beyond that site in every direction excepting towards the south, where one of the main streets forbad further extension.

In the design of this Cathedral Mr. Pearson has produced an adaptation of the English work of the thirteenth century, with some traces of foreign influence, and the whole stamped with the impress of his own individuality.

It is of the double cruciform plan, the narrow and lofty eastern transepts contrasting with the broader treatment of those of the crossing. It will have, when completed, all the features of our old English Cathedrals: Nave and aisles with south porch, western towers, western narthex, lofty transept with aisles, out of the southern of which, westward, is designed a circular baptistry, lofty crossing, with glazed lantern, open to the church, choir and aisles, eastern transepts, and—what is one of the features of the building—the old south aisle of St. Mary's Church connected with it on the south side by a lofty ambulatory. The chapter-house and cloister garth, with canons' residences, are designed to communicate with the Cathedral on the north side, but these, of course, are still in abeyance.

With the exception of the nave, with its aisles and the western towers, the ground plan of the building is completed. As seen from the railway, the want of length in consequence of the absence of the nave is much felt, and from a nearer point of view the low temporary church and the long ugly roof of the temporary west end are a miserable substitute for the west front, as represented in the complete design (also illustrated in this number from the drawing lent by Mr. Pearson, and exhibited in this year's Royal Academy), with its projecting gable and deeply-recessed circular window flanked by western towers of simple but carefully-studied design, and which will derive additional dignity by contrast with the more elaborated western narthex.

The nave as designed is 30 ft. wide, and in its length is divided into four bays, each 28 ft. wide, again subdivided by slighter piers, so as to form an arcade of eight arches on either side; over them an open triforium, coupled clearstory windows, and sexpartite vaulting. Abutting upon the main piers are flying buttresses over the aisle roofs. The aisles are lighted by an arcade of lancets separated by buttresses. The total height of the nave is about 70 ft.

The transepts at the crossing rise to the same height as the nave and choir; the southern arm is like the west-end of the nave in so far as they both have large circular windows, but the treatment is totally different. Here the window is flanked on the west-side by a massive turret, and on the east by a square Campanile rising with its pyramidal roof to a height of 140 ft. Below the rose window is a treatment of three lancets, and the enriched southern entrance, the gift of the late Canon Phillpotts. The gabled aisle and circular baptistry form a feature outside as well as in. The northern arm of the transept has still another treatment of the rose window with here an arcade below it.

Proceeding eastward we pass the old aisle, its continuous range of windows and panelled wall-surfaces contrasting with the more severe treatment of the cathedral. The choir has on each side five bays, little more than 12 ft. wide, with triforium and clearstory in character with those of the nave, but treated with a more delicate hand. East of these bays rise the eastern transepts, with angle turrets and a bold treatment of four lancets on the south side and coupled lancets on the north.

The east end is a treatment of three broad lancets in two tiers, with flanking buttresses terminating in open octagonal turrets, and with a traceried circle in the gable.

Entering by the south porch and standing under the western arch of the central tower, one is struck by the lofty proportions of the choir, with its tall arches, clustered shafts, enriched triforium, and recessed clearstory, terminating in simple quadripartite vaulting, while the rows of arcades, three in number, on the north side, give an effect of mystery and extent. The reredos extends across the choir, and is enriched with canopy-work and sculpture rising tier above tier, the crucifixion occupying the centre with a majesty above, and surrounded by Old Testament types of sacrifice. The altar is of wood, with a marble top, and is arcaded and decorated in gold and colour. The sanctuary is enclosed by side screens of stone, richly canopied, and provided with sedilia on both the north and south sides.

Westward the choir is enclosed by screens of wrought iron. The choir floor is of marble mosaic, and contains some pieces of ancient porphyry. The stalls are of teak, without canopies, and they do not return at the west end, and as there is no western screen the choir is quite open to the nave. The Bishop's throne stands on the south side of the choir east of the stalls, with enriched canopy, and simpler seats for chaplains on either side of it. In the centre between the stalls stands a large brass eagle, and next the north-east pier of the crossing is the pulpit, of considerable size, and enriched with sculpture.

The circular baptistery is raised three steps above the nave; the font, of red marble, stands in the centre of the circle, and has a canopied cover richly carved. The floor is in harmony with that of the choir. The groining springs from clustered shafts arranged around the wall, terminated in a centre boss.

A scheme has been elaborated for the painted glass for the whole of the Cathedral. The east

* This series of illustrations of the Cathedrals of England and Wales was begun in our issue of January 3, 1891. A list of those already illustrated, with particulars of future arrangements, will be found on page 366.

windows, the rose windows of the transept, and the lancets under them, and several windows of the choir, aisle, and baptistery have already been put in.

Under the choir is a groined crypt, which is level with the ground on the north side, and is of considerable elevation. In it provision is made for a temporary chapter-house, vestries, and singing school.

In the view of the Cathedral as at present existing, which forms one of the series of Cathedral illustrations, Mr. Prentice has, at our request, adopted a point of view which as much as possible loses sight of the unfinished portions of the building, and gives a view of the eastern portion as it will always appear; the central tower being the only uncompleted portion which comes into the view. The western towers, if completed, would hardly show from this point of view.

We may mention that at the time of the opening of the Cathedral we published (in the *Builder* for November 12, 1887) a long and full critical account of its architectural features and treatment.

DESIGN FOR EAST WINDOW, ST. MARGARET'S, LOWESTOFT.

THIS is a design by Mr. E. Frampton which was exhibited in the Royal Academy of this year. In regard to the general purport and treatment of the design Mr. Frampton writes:

"The entire window illustrates the Te Deum. In the tracery appears the 'nine orders of Angels' expressed by their various emblems and costumes according to the authority of old glass extant.

In the upper lights occur the figure of Our Lord, seated on a rainbow, crowned, and holding an orb, expressive of power, and encircled by cherubs. This circle reaches the lower lights, and embraces the figure of St. Michael the Archangel, who is the central figure in the lower light, standing, holding the scales and flaming sword of Justice and Retribution. The figure of Our Lord is surrounded by apostles and prophets, kneeling figures being those of the Virgin and St. John the Baptist. In the lower light, which illustrates the 'Holy Church,' are Archbishops, Bishops, martyrs, and saints.

Canopy work is used sparingly, owing to the peculiar formation of the window, and architectural bases are introduced owing to the fact that a reredos already existing blocks out to that extent the lower portion of the window."

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday afternoon last, at Spring-gardens, the Chairman, Mr. John Hutton, presiding.

New Member.—Mr. R. B. Doake, the newly-elected member for North Kensington (*vice* Mr. F. C. Baum, resigned) took his seat.

The Proposed Building Department.—On the motion for the reception of the report of the General Purposes Committee, Mr. Mercer asked the Chairman of that Committee what steps had been taken to carry out the recent resolution of the Council with regard to the establishment of a building department.

Mr. Benn, M.P., replied that the Committee had appointed a sub-committee to consider the question, and that sub-committee had already met, and a scheme had been laid before them, but it was found desirable to have legal opinion to determine the Council's power in that direction. No time would be lost in carrying out the directions of the Council.

The Chief Officials of the Council. — The General Purposes Committee reported that the Chemist to the Council asked to be allowed to advise the Corporation of Sheffield on a question connected with gas. In 1889 the Committee resolved that it was not expedient to comply with a similar request, and that was their opinion now. The view of the Council was that its officials should be solely and entirely at the Council's service, and, indeed, it seemed that the work of London was quite sufficient to require all their attention, and the Council agreed.

The Blackwall Tunnel.—The Bridges Committee presented a report the first paragraph of which was as follows:—

"We have received from Messrs. S. Pearson & Son, the contractors, a suggestion that certain portions of this work on the north and south sides of the river, which are specified to be constructed under compressed air, could be much better and more cheaply executed by the method of cut-and-cover. The Engineer sees no objection to this as regards so much of the work on the south side of the river as extends south of shaft No. 4, and we have therefore sanctioned it. The Engineer believes that the work will be equally strong, and the contractors have agreed that the substitution shall be effected at a saving to the Council of 7,000*l.* The Engineer has also pointed out to us the advisability of lining the cast-iron work with a superior class of concrete instead of brickwork as specified, as he finds that there will be considerable difficulty in fitting in and building in the brickwork in a solid manner among the flanges and bolt-heads, some of which will project 10 in. into the concrete. He has also suggested that the whole tunnel should be faced internally with glazed tiles in preference to glazed-face bricks, as likely to form better work. He has also brought to our notice the advisability of forming a granite plinth where the glazed tiles or brickwork would meet the footway, and he states that an improved appearance on the otherwise bald section of the tunnel would be produced by a polished granite moulding carried along the sides of the tunnel at a height of 8 ft. above the footway, the sides for this height being carried vertical. We have sanctioned these modifications, which, when the saving by the use of concrete as compared with brickwork is taken into account, will entail for the whole work an increased cost of 14,000*l.*, one-half of which, it will be noticed, will be saved by the substitution of cut-and-cover for compressed-air work on the south side of the river. We have not to ask the Council for any further expenditure in respect of these alterations, as a sum of 50,000*l.* has been included in the estimate and contract to cover such modifications as the work proceeds. We therefore recommend:—

'That the decision of the Committee be approved.'"

A long discussion took place on this recommendation, considerable diversity of opinion being expressed as to the relative merits of enamelled bricks and glazed tiles for facing the tunnel.

Mr. Lloyd moved, and Mr. Stevens seconded, the following amendment:—

"That the opinion of Sir B. Baker and Mr. Greathead, as consulting engineers, be taken before the proposed important changes in the construction of the Blackwall Tunnel are sanctioned."

On a division, the amendment was carried by 74 votes to 41.

Mr. Marsland moved, as a further amendment:—

"That the whole question of the alterations specified in the report be referred back to the Committee, with instructions to reconsider it and bring up a further report to the Council."

This amendment was seconded by Mr. Hoare, and carried by a large majority.

Tenders, Barking-road Bridge.—The same Committee reported on this subject in the following terms:—

"We have considered the tenders for the reconstruction of this bridge which were referred to us by the Council on September 27.* On an examination of the tenders, it was found that all the firms had not filled in the schedule of wages to be paid to the men who will have to be employed on the work. We accordingly asked each firm to state whether they would be prepared to adopt the rates of wages and hours of labour as fixed by the various Trades Unions concerned. The Thames Iron Works and Ship-building Company, whose tender is the lowest, stated in reply that they were prepared to do so, but that it would necessitate an increase in their tender by the sum of 5,750*l.* The Company also stated that in the event of the Council not being able to furnish them with a site adequate for the purposes of their work, a further sum of 1,500*l.* would have to be added. The Council has some surplus lands at Barking-road Bridge which might be used by the Company. We therefore directed negotiations to be entered into with the object of the Company reducing their tender by the amount named, the Company being allowed the use of the Council's land. On inquiry it was found that the ground was not sufficient for all the purposes required, but the Company agreed to reduce the 1,500*l.* by 750*l.*, thus making the amount of their tender 54,353*l.* Notwithstanding that the Company's tender has been increased by the two sums named, it yet remains the lowest. A question was raised by the Company with regard to clause 47 of their tender, which makes the Engineer of the Council the sole arbitrator. The Company are quite prepared to accept Mr. Binnie as the arbitrator, but in the event of his being unable to act they desire that the President of the Institution of Civil Engineers should appoint an arbitrator instead of the Council. As there does not appear to be any objection to the request of the Company we have conceded the point. We recommend:—

'That, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, the amended tender of the Thames Iron Works and Ship-building Company, Limited, amounting to 54,353*l.*, be accepted, and that the Solicitor be instructed to complete the contract.'"

Mr. Arnold moved that the recommendation be referred back to the Committee, with an instruction to report particulars of the original and the amended tender of the Thames Iron Works and Ship-building Company.

The amendment was negatived, and the recommendation of the Committee agreed to.

The Height of Hoardings Enclosing Vacant Land.—The Building Act Committee reported as follows on this subject:—

"Our attention has on several occasions been directed to the many high, dangerous, and unsightly hoardings erected round vacant land in the county, and used for advertisement purposes. We have received deputations from the London Bill-posters' Protection Association, and from the London and Provincial Bill-posters' and Hoarding-builders' Society, with reference to these erections; and, after a careful consideration of the whole subject, recommend that the following regulations be approved and enforced by the Council in the future:—

(*a*) 'That no existing hoardings be increased in height so as to exceed 9 ft.

(*b*) That no new hoardings be erected exceeding 9 ft. in height.

(*c*) That existing hoardings exceeding 15 ft. in height be reduced to that height within six months of notice given.'"

Mr. Ranyard moved, as an amendment, that 15 ft. be the maximum height of the hoardings, any undue interference with which he deprecated, on the ground that the pictorial advertisements thereon displayed formed a popular picture-gallery. "Beautiful pictures some of them are," he added. He urged that to cut down the hoardings too much would be to throw a number of bill-stickers out of work.

Mr. Yates seconded the amendment.

Mr. Burns, M.P., supported the recommendation of the Committee, and said that he differed from some of his friends the "labour members" on this question, which was one which ought to be looked at by the Council "as a municipal authority responsible for the architectural homogeneity of our streets." He advocated a municipal tax upon posters, as in Paris.

On a show of hands being taken, the amendment was declared carried; but on a division being demanded, the amendment was lost, 52 voting for it, to 56 against.

Mr. Emden moved, as a further amendment, that the height of such hoardings should be limited to 12 ft.

This amendment was seconded by Mr. Cornwall, and was carried by show of hands, and, a division being demanded, the amendment was declared carried by 57 to 47.

Proposed New Fire Brigade Station at New Cross.—The Fire Brigade Committee presented a report recommending that tenders be invited for the erection of a new Fire Brigade station at New Cross.

Mr. Thornton moved, and Mr. Stockbridge seconded, the following amendment:—

"That the fire-station at New Cross be erected by the Council by the direct employment of its own labour, and that it be referred back to the Fire Brigade Committee to give effect to this resolution."

On a show of hands, only six members voted for the amendment, and the recommendation of the Committee was therefore agreed to.

Proposed Electric Lighting on the Victoria Embankment.—The Highways Committee presented a report recommending:—

"That it be referred to the Parliamentary Committee to take the necessary measures to obtain the sanction of Parliament in the next session to the carrying out of the electric light installation on the Victoria Embankment and the park and gardens, and the Westminster and Waterloo Bridges, referred to in a resolution of the Council of June 28, 1892."

The recommendation was agreed to, and after transacting other business, the Council adjourned at a quarter-past seven.

NEW CHURCH, GRANTULLY.—On the 12th ult. the foundation-stone was laid of the new church which is being erected at Grantully by Lady Stewart in memory of her late husband, Sir A. Douglas Stewart, Bart., of Grantully. The new building is in the Gothic style, and was designed by Mr. W. Bell, C.E., Aberfeldy. It is 74 ft. long and 26 ft. 6 in. wide, and is to afford accommodation for 200 sitters. There is an apse at the east end, and a small vestry at the north-east corner. The main entrance is in the south side. The church is built of native whinstone, the hewn-work dressings being taken from Gellyburn Quarry, on the Murthly property. The slates also come from Birnam. A memorial-window is to be placed in the west gable. The cost of the building is estimated at about 2,000*l.*

* For list, see *Builder* for October 1, p. 271.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

THE new session of this Association opened with a well attended meeting on the 1st inst., at which the President, Mr. W. Hale, F.R.I.B.A., delivered the annual presidential address to the members. He congratulated the members upon the steadily increasing numbers and on the improved position of the Association, and expressed the hope that its work would, as it became more widely known, induce the members of the profession to give cordial support. Referring to the past session's work, Mr. Hale pointed out that the most notable thing accomplished was the arrangement with the School of Art, whereby the architectural work had, while still remaining under the control of the able masters who have in the past conducted it, been supplemented and concentrated into a definite course of architectural study, extending over a four years' course, a course which it was believed would, with the addition of the Association classes, prove to be a very valuable one, and which it was hoped would in time be extended into a very complete one. Mr. Hale expressed the opinion that there was great reason for congratulation in the facts that so able a lecturer as Mr. Bidlake had been found in the Association to undertake the special lectures on Architectural Design, and that his lectures had been so well attended. Mr. Hale also said that, though it had been found impossible for the Association to do more this session than carry on the Classes of Design and Construction, it was the wish of the Council to see other special classes started in future sessions. In concluding his address, Mr. Hale gave many valuable hints to the student members as to methods of work, and expressed the hope that practising members would encourage their assistants and pupils to join the School of Art Association classes. A hearty vote of thanks to Mr. Hale for his address (proposed by Mr. Doubleday, and seconded by Mr. McConnal) was unanimously passed, after receiving the support of Mr. Peacock, who reminded the members that the connexion with the School of Art was due in a large measure to the work of Mr. Hale. Among the other members who spoke in support of the resolution were Mr. W. Henman, Mr. H. R. Lloyd, and Mr. C. E. Bateman. A brief response from Mr. Hale brought the proceedings to a close.

WORKING RULES FOR THE BUILDING TRADES OF LONDON.

THE following are the new working rules for the building trade in London, which will come into force on the 7th inst.:—

Working Rules for all Trades except Plumbers.

1. That the working hours in summer shall be fifty per week.

2. That during fourteen weeks of winter, commencing on the first Monday in November, the time shall be worked for the first three weeks eight and a half hours per day; during the eight middle weeks eight hours per day; and the three following weeks eight and a half hours per day.

3. That the present rate of wages for skilled mechanics and labourers shall be advanced one half-penny per hour.

4. That overtime when worked at the request of employers, but not otherwise, shall be paid at the following rates, namely:—From leaving-off time until 8 p.m., time and a quarter; from 8 p.m. to 10 p.m., time and a half; after 10 p.m. double time. No overtime shall be reckoned until each full day has been made, except where time is lost by stress of weather. On Saturdays the pay for overtime, from noon to 4 p.m., shall be time and a half; and after 4 p.m., and on Sundays, double time. Christmas Day and Good Friday shall be paid for the same as Sundays.

5. That employers shall give one hour's notice or pay one hour's time, on determining an engagement. All wages due shall be paid at the expiration of such notice, or walking time if sent to yard.

6. That men who are sent from the shop or job including those engaged in London, and sent to the country, shall be allowed as expenses 6d. per day for any distance over six miles from the shop or job; exclusive of travelling expenses, time occupied in travelling, and lodging money.

7. That payment of wages shall commence at noon, or as soon thereafter as practicable. on Saturdays, and be paid on the job. But if otherwise arranged, walking time at the rate of three miles per hour shall be allowed to get to the pay-table at twelve noon.

8. That employers shall provide, where practicable and reasonable, a suitable place for the workmen to have their meals on the works, with a labourer to assist in preparing them.

9. That wages earned after leaving-off time on Fridays and Saturdays only shall be kept in hand as back time.

10. That the term "London district" shall mean twelve miles radius from Charing-cross.

11. That six months' notice, on either side, shall terminate the foregoing rules, to expire on May 1. The foregoing rules shall come into force on the first Monday in November, 1892, but the increase of pay to bricklayers shall commence from the first week in July.

Working Hours for all Trades except Plumbers,

For Fourteen Winter Weeks.

For Three Weeks commencing the First Monday in November:

First five days of each week, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon, 12.30 p.m. to 4.30 p.m.
Saturdays, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon. Equal to 47 hours per week.

For the next Eight Weeks:

First five days of each week, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon, 12.30 p.m. to 4 p.m.
Saturdays, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon. Equal to 44½ hours per week.

For the following Three Weeks:

First five days of each week, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon, 12.30 p.m. to 4.30 p.m.
Saturdays, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon. Equal to 47 hours per week.

For Thirty-eight Summer Weeks.

First five days of each week, 6.30 a.m. to 8 a.m., 8.30 a.m. to 12 noon, 1 p.m. to 5 p.m.
Saturdays, 6.30 a.m. to 8 a.m., 8.30 a.m. to 12 noon. Equal to fifty hours per week.

Masons and joiners in shops to have one hour for dinner all the year round, and work half an hour later than the time specified for the winter months, thus making the same number of hours as worked outside on jobs, namely, as laid down in Rule 2.

Carpenters and joiners who are in receipt of full wages, and who have been employed for two hours less than the hours mentioned above, shall, on discharge, receive one hour's notice, to be occupied, so far as practicable, in grinding tools, with one hour's pay in addition.

Working Rules for Plumbers.

1. That the working hours in summer shall be forty-seven hours per week.

2. That during fourteen weeks of winter, commencing on the first Monday in November, the time shall be, for the first and last three weeks, forty-four and a half hours, during the eight middle weeks forty-two hours per week, in all cases where the other trades cease work at 4 p.m.

3. That the present rate of wages for skilled plumbers shall be advanced one half-penny per hour from the first Monday in November, 1892.

4. Payment for overtime and all other rules to remain in force as at present.

Working Hours, &c., for Plumbers.

For Fourteen Winter Weeks.

For Three Weeks commencing the First Monday in November.

First five days of each week, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon, 1 p.m. to 4.30 p.m.
Saturdays, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon. Equal to 44½ hours per week.

For the next Eight Weeks:

First five days of each week, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon, 1 p.m. to 4 p.m.
Saturdays, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon. Equal to 42 hours per week.

For the following Three Weeks:

First five days of each week, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon, 1 p.m. to 4.30.
Saturdays, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon. Equal to 44½ hours per week.

For Thirty-eight Summer Weeks.

First five days of each week, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon, 1 p.m. to 5 p.m.
Saturdays, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon. Equal to 47 hours per week.

Overtime.—Plumbers being required to work overtime shall receive, from 8 p.m. to 11 p.m. time and a half; from 11 p.m. to 7 a.m. double time. Saturdays, from 1 p.m. to 5 p.m. time and a half; from 5 p.m. to 7 a.m. (Monday) double time. Sundays double time. Any plumber being discharged shall receive one hour's notice.

District and Expenses.—For plumbers, the term "London District" shall mean six miles radius from Charing Cross; and any skilled plumber sent to work over four miles from his employer's workshop shall receive all travelling expenses. If sent over eight miles from his employer's workshop he shall be entitled to one shilling per day extra, with the usual allowance for lodgings, and all travelling expenses. Should there be no accommodation for him to reach his work at 7 a.m., he shall be entitled to one shilling per day, unless he travel in the employer's time and be paid from 7 a.m.

All other rules to remain as at present in force.

Issued by the Central Association of Master Builders of London, 31 and 32, Bedford-street, Strand.

Books.

Excavations of the American School of Athens at the Heraïon of Argos, 1892. By CHAS. WALDSTEIN. London and Berlin: Ascher & Co.

DR. WALDSTEIN'S work at Argos began on February 15 of the present year, and no one can tax him with undue reticence as regards its results, when after the lapse of little over eight months he gives to the public this preliminary report, accompanied by eight phototype plates. We have so repeatedly urged on archæologists the duty of prompt publication (a thing quite distinct from hurried interpretation), that we are glad to see Dr. Waldstein set an example so admirable. The twenty pages of text that accompany the plates do not pretend to anything like complete exegesis, the "rich harvest of material brought to light," says Dr. Waldstein, "extending over so many periods of Greek life and entering into every department of archæological science, calls for elaboration which, in anything like a final shape, will occupy the student for several years."

As we have already some time back briefly summarised the course and extent of the excavations, we proceed direct to such material as will be new to our readers. And first, in turning over the plates, we come (plate vii.) on a small archæological fragment which has a familiar look and carries the memory back to the Erechtheion at Athens—we mean a fragment of the cyma of the Heraion. The ornament upon this consisted of "two volutes joining, out of the junctions of which rises an anthemion in modified lotos pattern. The volutes end on either side in the honeysuckle pattern, below which one smaller curved line sweeps inward, and ends in a smaller volute beside the anthemion;" but the noticeable feature is yet to come: "Each smaller volute is surmounted by a bird." So far as we remember, this bird appears elsewhere only on the Erechtheion cyma, in a fragment that used to be near the entrance-gate to the Acropolis, and, if our memory does not deceive us, another slab with a bird lies in the Museum at Argos, and no doubt came from the Heraion. A photograph of the Athens fragment lies before us, and, — *pace* Dr. Waldstein,—is much superior to the Argos work. There are some minor differences, the ornament is grouped more closely in the Athens fragment, the bird less elongated, the whole thing looks stronger, and, to our minds, earlier; the curves in the anthemion are downwards and inwards in the Athens fragment, upwards and outwards in the Argos one.

Besides the cyma fragment in plate vii. are published, of architectural fragments, two lions' heads, once affixed to the cyma. Dr. Waldstein compares these carefully with those of the Parthenon, of the older temple of Asklepios at Epidaurus, of the Tholos at Epidaurus, and of the mausoleum at Halicarnassus; those of the Parthenon, though much softer in the modelling of the head generally, is simpler in the treatment of the mane and in the modelling of the lips. The nearest analogy to the Heraion lions appears to be in those from the older (fifth century B.C.) temple of Asklepios at Epidaurus, while those of the Tholos, now attributed to the younger (fourth century B.C.) Polycleitus, are markedly much more realistic.

It is in the careful examination of such details as treatment of hair, eyes, eyelids, lips, for the dating of style, that Dr. Waldstein excels; and, indeed, it is the only secure method. He applies it with the utmost care to the head of Hera, which he holds, and we think rightly to be "a representation of the Argive school of the second half of the fifth century, and as such to hold some relation to the work of Polycleitus, who established the

ideal type of Hera in this temple." But Dr. Waldstein's analysis can only profitably be followed standing close to the head itself, a cast of which he has presented to the Fitzwilliam Museum. The terra-cotta figurines, votive for the most part, are chiefly of interest in connexion with mythology, the important finds of pottery to which we may look for light on the "Mycenæ" question could not adequately be illustrated at such short notice; they are reserved for a second issue to be hoped for in the spring.

Griechische Götterideale in ihren Formen erläutert von HEINRICH BRUNN. *München*, 1893. *Verlagsanstalt für Kunst & Wissenschaft-Vormals, F. Bruckmann.*

THIS book is an interesting collection of reprints, dating from as early as 1846. As the articles thus gathered together are scattered far and wide in foreign "transactions," they will be welcome, perhaps more to artists and art-lovers than even to archæologists. The first paper is devoted to the Hera Farnese,—a head to which new interest attaches now in connexion with Dr. Waldstein's discovery of a "head of Hera" at Argos. Other papers deal with the Demeter of Cnidos, the Hypnos of the British Museum, the Asklepios of Melos. All have this in common, that they attempt, by elaborate analysis of details, to fix the characteristics of the Greek "ideals of the gods," but, necessarily, the series lays no claim to completeness. So far as it goes, however, the book is pleasant reading, and made the more enjoyable by the beautiful autotype plates with which it is illustrated.

Max Ohnefalsch-Richter. Die antiken Kultusstätten auf Kypros. Mit 18 *Tafeln. Leipziger Doktordissertation XI.*

AN English version of this valuable dissertation has appeared, but it is printed only for private circulation,—"English" we say for want of more precise terminology, "English as she is spoke" among German doctors would be nearer the mark. For this reason, as well as that the pamphlet is privately printed, we draw attention to the German version, which is less unpleasant reading. But, form apart, the dissertation is one of which the English educated public cannot afford to be ignorant. Cyprus is a field we have now made our own, in a sense. Dr. Richter, in his introduction, gives an account, personal and pathetic, of his long preliminary struggles. They have resulted in the determination of no less than seventy-two sites of ancient seats of worship in the island, a panorama of which is given in an admirable map, reproduced from that too short-lived periodical, the *Owl*. Further, a practically new chapter in the history of Greek art has been written. The full exposition of his views Dr. Richter reserves for the publication of his great work, "Homer, The Bible, and Cyprus," a high-sounding title well-calculated to "draw" an English and American public; the present dissertation is to form one of the chapters of this treatise. "If," says Dr. Richter, "the copper, bronze, and iron periods are definitely established for Cyprus, we need not be surprised to find that the manners, customs, weapons, utensils, and apparatus of worship pictured in the Bible and in the Homeric poems are more closely illustrated by discoveries made in Cyprus than by anything which has been observed elsewhere." He promises in this coming volume not only to throw light on Troy, Mycenæ, and Olympia, but also, by the help of Cyprian monuments, to explain "a long series of the oldest passages in the Bible, even whole paragraphs and chapters." The book, when it appears in English dress, is sure to excite much attention, and no small controversy.

The Timber and Wood-Consuming Trades' Directory. London: *Timber Trades' Journal* Office, 14, Bartholomew-close, E.C.

THIS is a very useful publication, first issued four years ago. The new edition has been revised and corrected up to date, and, having at its back the staff of the *Timber Trades' Journal*, great facilities for correctness and accuracy of information on special trade matters have been available, and have been fully used. The directory contains classified lists of firms in the United Kingdom engaged in the foreign, colonial, and home timber, mahogany, and hard-wood trades, and the principal wood-consuming industries; also the names of exporters of timber in the various timber-producing countries, and the Continental and Colonial importers of timber. It contains several maps and plans of timber-docks, &c., and is bound between boards of "Jarrahdale" Jarrah, an Australian wood possessing several useful qualities.

Correspondence.

To the Editor of THE BUILDER.

"ARCHITECTURE A PROFESSION OR AN ART."

SIR,—I have read the recently-published thirteen essays under the above heading, and your review of same, in which you so admirably sum up the various points under discussion.

The "Memorialists" have done good service in placing before the public the high objects and aims of our calling, and we of the craft cannot but be grateful for the manifest sincerity and enthusiasm with which they, one and all, insist upon the nobility of architecture as an art, and the devotion which it demands from those who practise it. I find myself, for the most part, cordially in sympathy with their views on the education of architects and their insistance upon the wisdom of alliance with the arts and crafts, without which architecture is shorn of her proper adornment. With you, Sir, we must deplore that, with so much that is well and ably expressed, there is so much that would have been better left out.

The contemptuous manner in which the Institute and its members are spoken of is scarcely courteous or in good taste. Those who are acquainted with the facts know that in the ranks of the Institute are many men every bit as eminent as those who are outside and seek to degrade it; and among those who are now dead, men whose works live after them, who, whilst living, showed by their actions that they had aims beyond their own practice, and endeavoured, in concert with their fellows, to raise their art, help others, and not to stand aloof and study each his own interest solely.

The system of examinations established under the new Charter is not the work of to-day. For many years the subject has been under discussion and partial experiment. Now it is fairly on its trial, and the response which the younger men have made to the invitation is most encouraging to those who have, without hope of reward, save that of achieving success, given themselves to the establishment of these examinations.

I observe that the "Memorialists" generally admit the possibility of testing a student's knowledge on the Science side, but altogether deny it on the Art side. No doubt there are difficulties in the way; but they are not insurmountable, as witness the competition for prizes at the R.A., the Institute, the A.A., S.K.M., and other bodies. If these and the competitions for public buildings, in which these gentlemen themselves compete, are not in the nature of examinations, then words have no meaning.

It seems to be taken for granted by the "Memorialists" that you cannot examine in architecture; that the system, if once firmly established, will so cramp the men who enter the profession that only the most dire results and the eventual destruction of the art may tearfully be looked for. Admission to all other professions is now by examination, whether we like it or not. Does it destroy or cramp the powers of the members of them?

You cannot examine a candidate for holy orders in his spiritual gifts; the lawyer in eloquence, tact, or shrewdness; the doctor in those special qualities which make the successful practitioner; the soldier in bravery and ready use of resources; the sailor in what he will do when facing the dangers of the ocean. Such qualities can only after experience be brought to the test. All that examination can do is to insist upon a certain standard of excellence, and to set before the student an object to work for, a goal for him to reach. If instead of cavilling, the essayists had taken the trouble to make themselves acquainted with the good which has been done, and the advantages which our students have gained and many times owned to, it is to be hoped we should have had less of this uncharitable writing.

Several of the authors of these essays are hard upon the men who practise as architects and surveyors. With them, to touch anything outside building and its adornment is the unclean thing. Many who practise in both capacities would, doubtless, were they to consult their own inclinations, be only too happy to follow the tempting side of their profession; but they have to live, despite the remark quoted of the cynical Frenchman, "Monsieur, je n'en vois pas la nécessité!"; and they have a right to live and to take as they please any work that is legitimate and honest and in their ken to perform. With an assured income, outside one's profession, it is easy to wait in your office until the desired plums drop; but we are but mortal, and, without extraneous sources, cannot exist on a glass of water and a toothpick.

One would very much like to know what our brethren in the provinces think of these transcendental views of an architect's calling. Mr. Jackson and his friends will, perhaps, admit that there are competent men amongst them, and that it is not necessary, when a building has to be erected, to send to London to secure the services of those who never touch surveying. Every country practitioner, I take it, is glad to land every fish which comes to his net, and does not trouble himself as to where the diverging lines betwixt architecture and surveying commence or leave off. They have probably some very good reasons to give *why* they should exist, and may in their turn ask some awkward questions.

That the system of examinations as now carried on at the Institute is perfect, the most ardent supporter will probably not assert: it has hardly had a sufficient trial. As time goes on, the weak places will be strengthened, and experience will point out where new departures are needed.

I cannot close this letter without saying how unfair, in my opinion, is the interpretation which so many of these writers put upon Mr. Macvicar Anderson's remarks upon the qualifications of an architect. Mr. Norman Shaw was the first to fall into this error, and the others have followed him. No one reading what Mr. Anderson *did* say, and the meaning put upon it, will, I think, consider it just. This, and much else in the book are evidences of a weak case, and of faulty arguments. Whilst the men who now attack the Institute have been standing by, doing little or nothing for any one but themselves, the Institute has, perceiving the needs of the times and the drift of events, displayed increased energy. Had these gentlemen entered the Institute (where they would have been welcomed), they might have helped to shape its policy and lent their counsels to its guidance; they chose to turn the cold shoulder. What now do they hope to achieve?

COLE A. ADAMS.

SIR,—An admirable article in the *Builder* of October 22, fair in appreciating the honest belief,—or rather doubts,—of the "Memorialist" brethren, judicial in the exposure of some inconsequent reasoning, has done something to steady the mind of one exercised by some uneasy doubts.

I am one loyal to the policy of the Institute, and with a conviction that its tendency is right on the vexed "Examination" question; but I have still the uneasiness of one wrestling with a religious doubt,—are we all right, or the "Memorialist" persuasion altogether wrong?

An architect is born, not made, say this persuasion in effect. Well, not altogether made, but partly made, say other reasonable men. Cannot we go so far as to frankly admit the perfect architect is past finding out and hallmarking by examination test?

Yet is not the Institute on right lines in bringing "into its Fellowship,"—in the simple English sense of community,—those who have been proved by some examinative test, or, by their works, to have acquired a liberal education and the technical knowledge and practical experience without which any man offering himself for the community of architects is a fraud and a pretender.

Somehow I feel with the Memorialists we must go higher than this, and I go with my friend Mr. Blashill that we cannot elevate the Fellowship of the Institute into a title of distinction. Why should we, when in the simple or original intent of the word it means nothing of the kind?

Are there not men, such as Mr. Norman Shaw and Mr. T. G. Jackson and other malcontents, at whose honoured names we instinctively bow when we meet them and say "Master!" May

it not be in this instinctive recognition of the Master Architect by the community of the Institute, and by the wide suffrage of its members, that the true distinction of architect in its highest sense may be found, always provided that by the tests of the Institute he has been found to be an educated one?

For practical purpose of distinction I would affix to the name of the architect pronounced by the suffrage of his fellows to be a master in architecture the letter M., thus:—

NORMAN SHAW, M., F.R.I.B.A.

I think that looks well. Could such a man object to such a distinction? Look at the pull we should have over these worthy and able theorists whom we know to be masters in architecture indeed, and yet who stand apart from our Fellowship. We could confer the distinction on them *whether they liked it or not.** The architects of this free country are free to hold and express a free opinion as to whom among them are masters of their craft.

And I believe such distinction would not be disliked. I cannot believe that there is an architect in the kingdom so elevated in his position and ideas as to resent the honest consent of his fellows,—that by his proved knowledge of his craft, which may be tested, and by the exhibition of genius in his works, which is otherwise not measurable, he was recognised as a Master Architect.

Shortly, then, I sum up this suggestion.

Recognition of distinctive fitness by the title of Master in Architecture, and election to this distinction by the suffrage of the Fellowship of the Institute with or without the consent of the architect so recognised, and so constraining those fit men and hitherto unwilling to be of the Fellowship of Architects.

THOMAS DREW, F.R.I.B.A.

BONES AS A BUILDING MATERIAL.

SIR,—In the Churchwardens' account of Kirkby Wharfe, Yorkshire, for 1704, is an item for "Sheepshanks for hanging ye tiles, 2s. 6d." They were cut into pegs, and would be everlasting; some were found in their places in 1860. I cannot get a sight of any, but I have reason to think that their use was common. What is known of this material?

In Peter Kalm's account of his visit to England, in 1748, this Swedish observer describes walls or fences in common use near London to separate meadows, market-gardens, &c., built of the cores of ox horns, to each of which was attached part of the skull. In the best work they were put in layers as close as they could be packed, the points inwards; a 6-in. layer of earth was put between each layer of cores. The length was 4 ft., and the width the same. This disciple of Linnæus notes half-a-dozen plants, such as convolvulus and wall barley, that covered the top. Slighter fences tapered to a narrower top. Are any such fences remembered?

Kalm also notices that these cores were carted out on the high roads and there spread, earth and sand being laid on them, which made the road firm and durable. Is our term, "hard core," applied to clinkers, &c., a survival from this use?

Kalm saw where a gentleman had set the leg-bones of oxen and horses in the ground as edges to his flower-beds, sticking them close together, the transversal end downwards and the round curled end upwards (to keep the earth from rolling down on the path), as he had seen also near Moscow. Here is a fresh item, I think, for the formal garden.

The grotto in Wanstead Park (recently burnt out) was paved with sheep shank bones, laid in patterns,—conducive to corns, one would expect; but they would tally with the ornamental pavements of small round pebbles, common in old summer-houses, but now amongst the lost arts.

Bones, and particularly those which, like the cores, were not used in manufactures, would accumulate; but when their use in manure or in chemical works became known, they would cease to be applied to road-making and fencing.

THOS. BLASHILL.

LOCAL CONTROL OVER DRAINAGE AND SANITARY WORK.

SIR,—Having read Mr. Dicksee's and Mr. Kemsley's letters in your paper, I should be glad to add a word on the subject of local control over drainage and sanitary work.

I quite agree with what has been said on the unsatisfactory working of the present system of local control, which varies both in quantity and quality according to the energy, knowledge, and scientific acquirements of the local Surveyor and Medical Officer of Health.

As the qualifications of these officers are usually dependent, as regards the Surveyor, on local, and, as regards the Medical Officer, on theoretical training, and as their work lies rather in detecting than in remedying defects, it is not surprising that the regulations by which they would control those who have to design and execute the work should be varied, insufficient, and even at times harmful.

To improve this state of affairs Mr. Dicksee would charge the County Councils with the formation of a code of regulations for their own guidance; but I would go further, and, as the question affects the well-being of the whole country in a similar manner, I would urge that one code of regulations should have force over the whole country.

This, I imagine, could only be undertaken by Government, and by means of a commission consisting of the best sanitary authorities, representatives of the County Councils and other local bodies, and their Surveyors, who should draw up a code of regulations, such as we have in the Building Acts.

To provide for the very rapid advance of sanitary knowledge, the code should be revised every five years, or at more frequent intervals if necessary. As this would entail a considerable outlay, it would require some justification from an economical point of view before it would be likely to gain public acceptance.

It should first be proved that the present system encourages wasteful expenditure, and then that the system I propose would tend to bring it within reasonable and profitable bounds.

I think I shall escape contradiction when I say that a very large proportion of sanitary work is now both designed and executed by those whose main recommendation is a self-assumed title and a bold advertisement, and that their operations frequently result in either evident failure or in condemnation when put to a scientific test.

It is a notorious fact that in some of the most fashionable parts of London large mansions have been drained and re-drained in the course of a few years. This has been both costly and wasteful, and the regulations of the local authorities have been powerless to check it.

A complete code of rules, dealing with the practical details of sanitary science, rigorously enforced, would render such operation well-nigh impossible, and the observance of the rules would afford a reasonable guarantee that the character of the work is respectable.

There are many, however, to whom it would not only be necessary to show that improved sanitary regulations are required, but that they can be obtained. There is much scepticism abroad on this subject, so many remedies having been found worse than the disease.

I am disposed to think that nothing but an agreement among sanitary scientists expressed in such a code of regulations as I have suggested, bearing the stamp of Government authority, would be sufficient to dispel doubt as to the theoretical possibility of a genuine sanitary reform, and, in addition to this, I believe that a practical illustration of the principles upon which the code is based would be required before many would believe in its practical efficacy.

This could be done by the establishment of museums in different parts of London and in large country towns, where both householders and others could study the subject. Two attempts have been made in this direction,—first, by the establishment of the Parkes Museum, and quite recently by the Hornsey Local Board in the sanitary exhibition arranged by their Surveyor, Mr. De Courcy Meade, which will doubtless be of great use in the neighbourhood; but the advertising element in the Hornsey exhibition, and the old-fashioned style of the Parkes Museum, shows that the practical working out of the scheme has not yet fallen into sufficiently strong hands.

Whether the plan could best be worked out as a Board of Technical Education or otherwise may be a question, but I would only urge that it should be done on a recognised principle; which would not be the case if it were left to the officers of separate County Councils, Vestries, or Local Boards.

ARTHUR BAKER, F.R.I.B.A.

COMPETITION AND COST.

SIR,—I have been interested in the remarks of your correspondent "Competitor" (page 323 *ante*) in reference to the Accrington Technical School Competition, and was pleased to see your own footnote to his letter.

I know nothing of this competition or the merits of the case, but it opens up a most important subject to architects, viz., the cost of competition buildings. Much has been said from time to time of the injustice of competition in respect to the wrong man being chosen, but there is another point of equal importance, viz., the unfairness of public bodies asking architects to make designs for them at a price which will scarcely provide a decent shell for the buildings they desire to erect.

If it were not a serious matter, it would be amusing to study some of their instructions. They usually read in this way:—

"The building must be of substantial character faced with stone, and the architect's estimate must include all fittings, electric lighting, gas and water supply, painting and decoration, &c., &c. The estimate must not exceed £——, and should it be found, &c., &c."

Here follows the usual clause which places the unfortunate competitor entirely at the mercy of those who have been dishonest or ignorant enough to set him a ridiculous problem, for it will generally be found that the sum named is too small by about 35 per cent., with no margin whatever for extras and contingencies.

Of course, it may be said that the remedy is in our own hands, and that architects should decline such invitations; and for my own part I prefer to devote my time to private practice, and decline such unsatisfactory invitations; but it is to be regretted that those members of the profession who have a conscientious desire to do their work well should be debarred from taking part in an important public competition because enough money is not specified for the building.

But where, it may be asked, is the remedy? and indeed, this is a difficult question to answer. At a time when many of our leading architects are squabbling with each other, there does not seem much chance of any help from them. We must, therefore, look to you, Sir, to assist us, if you can, by giving every consideration to this question of cost in our competitions, and condemn with a strong hand the unfairness of our public bodies in setting such impossible problems.

With all due respect to our assessors, I do not consider they are free from blame; they choose a design and with a passing remark leave the question of cost to be fought out as best it may. My own town is a case in point. A large public building was erected some years ago, the design being selected in competition by an able and experienced assessor. The estimate was absurdly low, and had the assessor dealt with the subject of cost in a very emphatic way the town might possibly have been saved many thousand pounds of wasted money in repairing defects which would never have occurred had a larger sum of money been expended in the first instance.

If public bodies would only consult the assessor *before* the competition many of the difficulties would disappear; he could then advise them as to the cost of the proposed building, and the chances are that more architects of standing would respond to the invitation for designs, and our public buildings would, in consequence, be benefited.

It would be a good thing if some reliable statistics could be published in the *Builder* of the cost per cubic foot of our public buildings which have recently been erected.

£. S. D.

"WANTED, A FIFTEENTH-CENTURY SCULPTOR."

SIR,—In reply to Mr. Hutchinson's question whether I am going to churchwardenise my statuette, I should have thought my letter was worded in such a way as to make it abundantly clear that I intend to do no such thing. I claim, indeed, to be a representative of the one-tenth, not of the nine-tenths to whom he alludes; and it is just because I am so keenly alive to the danger of entrusting works of antiquity to incompetent hands that I appealed to your readers to inform me if there be any artist living who is capable of restoring, in the literal sense, an old carved figure such as mine. If any one else besides your correspondent feels uneasy on the subject, I give him my word, as a critic not too readily pleased, that, unless I am satisfied, I will never allow the statue to be touched. At the same time, I have no sympathy with the *cultus* of wreck, nor can I view with complacency the ravages of time, still less those of iconoclasm. Such accidents may have a picturesque attractiveness for the virtuoso, but no one can pretend that they are in accordance with the original design. And could the bygone artists come back to look upon their damaged handiwork they would be the first to complain of its present condition, and to wish its defects remedied wherever possible. My statuette was formerly coloured, and sufficient traces remain to enable me to paint it again, which I propose to do so soon as those parts which,—when I bought it, I found replaced by clumsy modern carpentry,—have been adequately renewed. The head of the Madonna at one time bore a movable crown, presumably of metal. That omission also I hope to repair. I have no doubt that Mr. Ashbee, of the Guild of Handicraft, will be able to reproduce a suitable crown, from old examples, in repoussé copper-gilt.

AYMER VALLANCE.

WALSALL BATHS COMPETITION.

SIR,—In the Instructions issued for the above it is distinctly stated that any architect revealing his incognito (intended to be preserved by the "Motto" to be adopted by him) will be disqualified for selection; yet in the face of this definite clause it is a fact that the author of the design placed first, though not directly disclosing his name, yet went so

* Not the "F.R.I.B.A.," surely.—ED.

far as to say that he had erected the baths at Camberwell.

Surely this amounts to the same thing, and should have been enough to disqualify him ; yet he was placed first.

It shows that the statement biassed the committee, that one of the councillors referred to it in the discussion, saying he would rather trust one who had erected baths than a novice.

That there was considerable difference of opinion in the Council with regard to the committee's recommendation is evidenced by another councillor, who moved an amendment that a professional assessor should be called in, saying that if the boilers, as shown on the selected design, burst, they could not be removed after once being fixed in the positions shown.

Another councillor pointed out that the Turkish Baths as shown could not be ventilated, and objected to the positions of the closets.

The design placed third had the following points, which I suppose specially recommended it for selection. Size of dressing-boxes, 2 ft. by 1 ft. 3 in. ; first and second-class entrances, but the classes intermixed ; no waiting-rooms, and the entrance through a road 9 ft. 6 in. wide, encroaching 3 ft. on to adjoining land. The second and third premiums were awarded to Walsall men. The second design also has dressing-boxes 2 ft. by 1 ft. 3 in. It seems to me a great pity that the Town Council invited professional gentlemen to waste their time in sending in designs if they did not mean to deal with the matter in a perfectly fair and straightforward manner ; and, although I do not suppose it would have much effect, I would suggest that every competitor who fully complied with the instructions should sign a memorial protesting against the way this competition has been decided. The significant remark of one Councillor, who would not vote, and gave as a reason that he saw "so much fingering on the subject." almost compels one to come to the conclusion that all was not as it should have been. I enclose my card.

ANOTHER COMPETITOR.

The Student's Column.

CONCRETE.—XIX.

CONCRETE-MIXERS, ETC.

THERE are several kinds of concrete-mixing machines to be obtained which can be worked either by hand or steam. One of the first to be adopted was a simple revolving cylinder inclined at an angle of 6 or 8 degrees. It was much used in Germany about thirty years ago. In America a cubical wooden box has been used, having an axle running diagonally through opposite corners ; "eight revolutions of the box, made in less than one minute, are found to be quite sufficient to produce the most thorough incorporation of the mortar with the broken stone and gravel ;"* the box, measuring 4 ft. each way, is charged with about 36 cubic feet of mortar and aggregate, measured separately.

Messent's concrete-mixer is a well-known machine ; "it consists of a closed box or chamber revolving on an axle, and of such a form as, when half filled with the materials for making concrete, to cause them to be turned over sideways, as well as endways, four times in each revolution of the chamber, so that, in from six to twelve revolutions (the number necessarily being varied according to the weight and nature of the materials), a more perfect mixture is effected than can possibly be produced by hand." So say the makers, Messrs. Stothert & Pitt, of Bath.

Le Mesurier's machine has an inclined cylinder with dividing plates ; Stoney's has an inclined trough along which the concrete-materials are carried by means of a revolving screw. A simple apparatus, described by Gillmore, consists of a vertical shoot divided into several compartments by shelves or flaps hinged alternately on opposite sides of the shoot ; the materials are placed in the uppermost compartment, and the flaps are then dropped to an angle of about 45 deg. by means of levers, so that the materials fall from one flap to another until they reach the bottom in a state ready for deposition.

It is usually considered that machine-made concrete is more uniformly mixed than hand-made, and for considerable quantities it is much cheaper. Many concrete-mixing machines are used to-day for making the concrete required in the foundations and floors of large buildings, and they will come more into use for building purposes, when their advantages are better known. Before many years are over, architects will specify that all concrete in large works shall be machine-made.

Care and skill.—We are sometimes told that one of the great advantages of concrete is that skilled labour is not required, but that any one who can use a spade can make it. Yes ; but there must be continual intelligent supervision. There is nothing which the architect has to use which requires more careful superintendence than concrete, and perhaps this is one reason why architects make so little use of it in their buildings. Concrete of a sort may be easily made, but it is not easy to make really good concrete. Each ingredient must be tested or strictly examined, and every process in the manufacture must be closely watched. However good the ingredients may be, the resultant concrete may be little better than consolidated gravel or broken-stone, unless the measuring, mixing, depositing, ramming, and protection during setting, be carefully attended to.

Depositing.—The mixing ought always to be done as near as possible to the place where the concrete has to be used. It is better to move the platform or machine when these would be more than about thirty yards from the point of deposition. As mixing-platforms are more easily moved than machines, hand-mixing has some advantage in this respect over machine-mixing. For foundations in shallow trenches the concrete can be thrown by spade straight from the platforms, if these are near the trenches, or can be wheeled in barrows and tipped. The method formerly advocated of tipping concrete from a height of three or four yards is now discountenanced for the reason that the larger stones in falling become separated from the mortar and smaller stones, and the concrete is not therefore homogeneous and uniform. For the same reason, shoots are now falling into disuse ; a shoot has also the further disadvantage that the larger stones, on account of the velocity which they attain in passing down the shoot, fall some distance in front of its mouth ; whereas the mortar, sliding gently down, drops vertically from the mouth, thus counteracting to a great extent the labour bestowed in carefully mixing the ingredients. This evil can be mitigated by turning over and re-mixing the concrete immediately it reaches the bottom of the shoot, but no time must be lost either in the original mixing or in the depositing if this second mixing is to do any good. For deep trenches, the concrete, if it cannot be mixed in the trench, may be lowered in barrows or pails ; sometimes it is carried down in hand-barrows ; more frequently, however, it is tipped from the surface, as the cost of lowering it is not thought to be counterbalanced by the advantages gained. For walls, floors, &c., it can best be carried and hoisted in pails or barrows.

The concrete ought to be deposited as soon after mixing as possible, as any disturbance of the mass, after the cement has begun to set, detracts from the ultimate strength. Rapidity of execution where quick-setting cement is used, is a point which must be carefully attended to.

For depositing cement under water, hoppers or shoots are sometimes used ; but it is better to use a box or skip, so arranged that its contents can be released when it touches the bottom, either automatically or by pulling a cord. Into the details of such work and of the bag system it is not our province to enter.

Ramming.—The advantage of suitable ramming or punning is obvious. It compresses the concrete, rendering it more solid and free from voids, and squeezes out all superfluous water. We have seen that the Romans adopted it. Too much ramming, however, is dangerous, as it may be continued until the cement has begun to set, and in this case a loss of strength is entailed. For this reason, concrete made with Roman or other quick-setting cement ought not to be rammed.

Mr. E. C. Clarke (1885) "doubts the expediency of punning concrete, except when used in thin layers, as in pavement work, where it promotes consolidation and adhesion. In other cases, unless the concrete is very stiff, punning tends to separate the more fluid portions and to produce strata of different density, and also disturbs the setting." Note the saving clause,—"unless the concrete is very stiff."

Mr. Grant, however, carried out a series of experiments which showed conclusively that compression increases the strength of concrete. He declares that "for blocks, thin walls, sewers, arches, floors or paving, concrete may be punned in layers with advantage." The manufacturers of artificial stone and paving and of concrete drain-pipes almost invariably compress the raw material in one way or another in order that the goods may be strong and impervious to water.

The results of Mr. Grant's experiments on the crushing strength of concrete compressed and not compressed were given in Table XX. (see *Builder*, p. 306, *ante*). The compression was effected by beating the concrete into the moulds with a small mallet. The resultant gain in strength averaged 28 per cent. for the 1 to 6 mixtures, 28 per cent. for the 1 to 8, and 24 per cent. for the 1 to 10, a gain by no means to be despised.

But concrete not only gains strength by compression ; its density and consequently its imperviousness to water and its durability are also increased. Without ramming it is impossible to have impervious concrete.

Of course it is impossible to ram the concrete of walls with the same vigour with which the concrete of foundations may be rammed. For the latter a moderately-heavy punner of iron or of hardwood bound with iron may be used, but such an implement, if used for walls, would most likely cause the wooden boards enclosing the wall to bulge out, and the appearance of the wall would be irretrievably spoilt. For walls, therefore, a lighter implement should be used Concrete floors are frequently consolidated by beating with the back of the spade used in spreading the concrete.

Layers.—Opinions differ as to the thickness of the layers in which concrete should be deposited. Some advocate thick layers, some thin ones. The lime-concrete foundations of the Army headquarters at Simla were rammed in 3 in. layers. Layers so thin are very seldom adopted, because, whatever care may be taken, the joints between the layers are always a source of weakness. During the operation of punning, some of the water in the concrete is forced to the surface and brings with it part of the constituents of the cement, causing sometimes a film of soft clayey matter upon the surface. This effectually prevents the adhesion of the next layer. For this reason, concrete, which has been exposed for a day or two, should be swept clear of this matter, and also of all loose stones and dust, before another layer is added. The surface should also be well watered, and if good work is required, should be roughed with a pick, although this last operation is not as beneficial as is sometimes imagined. Mr. Bernays recommends that the surface of concrete in large walls, if it have been long exposed, should, in addition to being swept and watered, be dusted over with neat cement, and sometimes have a chase, say, 12 in. by 9 in., cut in it to form a key for the next layer. Some persons think each layer, after being swept, ought to be watered with thin grout before the next layer is laid, but grout is somewhat uncertain in its action.

Layers 9 in. or 12 in. thick are often specified, but layers 18 in. thick are on the whole more satisfactory. Sometimes a thickness of 2 ft. or even 3 ft. is laid at one operation. Thick layers ought not to be attempted unless a good machine or a very large number of men are employed in mixing the concrete, as otherwise the depositing and ramming such a thickness may take so long that the lowest portion may have begun to set before the men can finish the upper part, and this will cause a disturbance of the setting, and consequent weakness. On the whole, it may be considered best to deposit concrete foundations less than 18 in. thick in one layer, and above this thickness in two or more layers not exceeding 18 in. each. The concrete of retaining walls may be rammed in 18 in. or 24 in. layers. The frames used in forming the walls of buildings usually allow a thickness of 18 in. to be deposited at one operation, and never more than 24 in. Paving and floors must always be rammed in one thickness ; the surface, however, may be finished with finer concrete after the mass has set.

In the formation of concrete arches, care must be taken that the concrete is not deposited in thin layers following the curve of the arch, but the full thickness of the concrete must be laid at once and rammed in the direction of the thrust so as to form longitudinal courses like continuous voussoirs, having the joints between adjacent courses radial to the curve of the arch. This is an important point, especially if the whole arch cannot be completed in one day. The breadth of the longitudinal courses

* Gillmore.

will depend on their depth, &c.; it may be from 6 in. to 18 in. for large arches. Small arches, such as are used in floors, will be laid at one operation. During the ramming of the concrete in large arches a movable board with curved face can be used to retain the concrete and to form the extrados.

Protection during Setting.—Any disturbance of concrete during setting injures it. Cement cannot be gauged, left to set for a short time, and worked up again without loss of strength. Cement ground with water in a mortar-mill for half an hour makes considerably weaker briquettes than cement gauged by hand as quickly as possible. After cement has begun to set, it ought not to be disturbed until it has hardened sufficiently to bear easily any weight that may be put upon it. Walking across a concrete floor, before the hardening is sufficiently advanced, will cause rotten places in the concrete. For this reason, all concrete, especially in floors, arches, and roofs, should be carefully protected for some weeks after being laid,—the longer the better. Wherever practicable, all traffic across such concrete should be absolutely forbidden for as long as possible. When traffic across it is a necessity, the concrete should be covered with moist sand or sawdust or sacks, on the top of which strong planks must be carefully laid where required. It is useless to make good concrete, unless care be taken to protect it until it is hard enough to resist wear-and-tear.

GENERAL BUILDING NEWS.

New Infirmary, Southport.—On the 27th ult., the foundation-stone of a new infirmary was laid at Southport by Dr. Pilkington, the Mayor of the borough. The infirmary estate is situated about a mile and a quarter from the centre of the town, and is some five acres in extent. It is bounded on three sides by streets, the main frontage to Scarisbrick New-road extending 121 yards. The frontage of the building will be 243 ft. The style is a free treatment of Flemish, the external walls being of red stock bricks, relieved with Longridge stone dressings and a small quantity of terra-cotta, with roofs of Westmorland slates and red ridgings. The central portion of the main frontage will be two stories in height, while the ends and corridors, &c., will be one-storied. In the centre of the front block of buildings there will be an octagonal brick and stone clock-tower, surmounted by a wood and lead lantern, rising to a height of 76 ft. above the ground-line. One of the main features of the building will be the central arrangement of the out-patients' department, which is so planned that when patients leave the consulting-room they are at once in the centre of the building and equally distant from each of the wards. There will be accommodation at one time in the out-patients' department for 70 persons. The accident receiving-room and the operating-room are so planned as not to be within hearing from any of the wards. From the centre of the main corridor, running towards the back of the building, is a corridor 9 ft. wide, from which several of the rooms before mentioned are arrived at. The isolation ward block is a distinct hospital in itself, having ward nurses' room, two wards for two beds each, baths, lavatories, and linen rooms. Ornamental gardens surround the whole buildings. The site will be enclosed in a boundary-wall of stock brick and stone. Mr. C. Sydney Ingham, of Southport, is the architect.

New Fire Station for Dulwich.—On the 31st ult. the memorial stone of a new fire station was laid on a site in Lordship-lane, Dulwich, by Mr. N. W. Hubbard, the Chairman of the Fire Brigade Committee of the London County Council. The building will stand on ground leased from the authorities of Dulwich College, the frontage being 80 ft. and the depth 250 ft. Red brick relieved with Portland-stone dressings will be used for the five stories, including the basement, the roof being covered with Broseley tiles. A look-out tower, 100 ft. in height, will be erected. The design is by Mr. T. Blashill, the Architect to the Council, the drawing being prepared under the supervision of Mr. Robert Pearsall. Messrs. Stimson & Co., of Brompton, are the builders (the clerk of the works being Mr. J. Voice), their contract of 10,610*l.* being the one selected by the committee.—*Daily News.*

Additions to Trinity Church, Claughton.—Additions to Trinity Church, Claughton, which stands at the corner of Beresford and Alton roads, Oxton, have recently been completed. An organ chamber has been built behind the pulpit, and the organ has been moved from the gallery and rebuilt in it, with a new front. The pulpit has been remodelled, and a new platform has been provided, with stalls for the choir on either side. The new buildings, Late Gothic in style, are approached from the outside by a wide passage on the north side of the lecture-hall, and from the church and lecture-hall through the late vestry, which has been converted into an ante-room, leading into the new vestibule. They comprise a session-house, a committee-room, and a vestry, with necessary offices. The woodwork throughout is of polished pitch-pine. The wrought-iron gaseliers and brackets are by Messrs. Singer, of Frome; and the stained and leaded glass is by Messrs. Shrigley & Hunt, of Lancaster. The sessions-house and committee-room have been furnished in oak, by Messrs. O'Niell; and the vestry by Messrs. Waring, of Liverpool. The total cost is estimated to be about 1,450*l.*; and the work has been carried out by Mr. W. H. Forde, of Birkenhead, under the superintendence of the architect, Mr. R. G. Sykes.

Science and Art Schools, Heaton, near Newcastle.—New science and art schools situated in North View, Heaton, have recently been opened by the Mayor of Newcastle. The building is constructed throughout of Sherburn bricks, the string-course and the cornice being of the same material. At the east end of the building there is an octagonal tower and a bell-turret. Internally, the corridors are all laid with concrete, the staircases are of the same material, and the various rooms are so arranged that they all have entrances from the corridors, besides having direct communication one with another. In the basement portion of the premises a heating apparatus is placed for the purpose of warming all the rooms by hot water. On the ground floor there are five class-rooms, capable of accommodating in all about 400 scholars. There is a cloak-room for boys situate at this portion of the building, with lavatories included, and retiring-rooms for the teachers are also provided. On the first floor there is a cloak-room for girls. The science and art department is on the next floor. It consists of six class-rooms. In addition to the class-rooms there is a room for the use of the head master, a photographic developing-room, a lecture-room and the laboratory. Opposite the laboratory there is an apartment in which cookery lessons will be given to girls, and a room for the head-mistress is close at hand. The apartments on the floor above are to be used for storing purposes. The various rooms are fitted with wrought-iron "Hopper" ventilators for the supply of fresh air. The school is provided with two playgrounds, for girls and boys respectively. The frontage of the school is 137 ft. The contractor for the building has been Mr. Jos. Elliot, North Shields, the heating apparatus was supplied by Messrs. Aynsley & Rennie, Newcastle, and the whole of the work has been carried out under the supervision of the architect, Mr. D. Campbell.

Proposed Rebuilding of the Royal Sick Children's Hospital, Edinburgh.—According to the *Scotsman*, the plans of Mr. G. Washington Browne for the proposed rebuilding of the Edinburgh Royal Sick Children's Hospital were approved on the 17th ult. The plans show a building based, in its style, upon the English Renaissance, occupying three sides of a quadrangle facing Carlung-place, having the administrative department in the centre block and the wards in the wings. The central building is carried up two stories above the wings, and is finished on its east and west ends with gables. The wall-head is marked by a cornice and balustrading, and a feature of the façade is the large square projecting oriel windows, which balance each other on each side of the central doorway, and are carried above the wall-head to terminate in a gable. Between these projecting oriels, and on the same plane, is the entrance porch, formed of a triple arch with entablature, and having over the middle archway a circular pediment enclosing the Royal Arms. On the Rillbank or north side the exterior of the administrative block is enriched with projecting windows, similarly treated and finished to those on the south elevation. At each corner of the ward wings there is an ornamental turret, and between these, and opening upon the wards, are balustraded balconies. The sides are plain, an ornamental feature, however, being given to them by a series of gablets breaking up the wall-head. The building is so set that it runs parallel with Carlung-place. The wards are 140 ft. apart, and stand north and south. The main doorway in the central block gives admission to a corridor, which runs east and west along the whole length of the building, and at the far end communicates with the wards. A cross-ventilated corridor cuts off the main building from the wings in which are the sick wards. Each ward is 84 ft. 6 in. in length, 23 ft. wide, 15 ft. high, and gives accommodation for twenty-four beds. Similar wards are repeated in the corresponding positions on the first floor. On the second or upper floor there is in the east block a spare ward with accommodation for sixteen patients; while in the west block, on the second floor, is an observation ward with four beds, and two isolated wards with one bed in each. This gives a total of 118 beds in the new hospital. Each ward has its own kitchen, &c., at the north end of the building next to it, while the lavatories, bath-rooms, &c., are situated in the turrets at the south end of the wards. These lavatories, &c., do not open directly off the wards, but off a ventilated corridor or lobby between the wards and the turrets. The wards are lighted by windows on each side and at the southern end. Fronting the doorway of the administrative block there is a lecture theatre, 25 ft. square, which will be fitted with galleries for the students. This is repeated on the first floor. On the first floor are placed the Board-room, a small museum in connexion with the lecture-theatre, an ophthalmic room, and dispensary, the staff dining-room, and a sitting-room for the nurses; while on the second and third floors are located the bed-room accommodation for the head nurses, and of the nursing staff generally. On the third floor towards the north are placed the kitchen, scullery, and servants' hall; and in the attic or fourth floor are the bed-rooms of the domestics, store-rooms, &c. The flats are connected with staircases and lifts. It is intended to build the hospital of red sandstone, and the various floors throughout will be practically fireproof,—the floors being carried on steel beams, and lined with cement concrete. The expense of erecting the hospital will amount altogether to from 25,000*l.* to 30,000*l.*

Free Library Extension at Kidderminster.—The foundation-stone of the new Free Library for the borough of Kidderminster was laid on the 17th ult. by Mr. Michael Tomkinson, J.P., High Sheriff of Worcestershire. The erection of the Library completes a set of buildings for art, science, and literature. The exterior of the Library will be similar to that of the School of Art, and the cost of its erection will be 3,240*l.*, exclusive of fittings, &c. There will be two large rooms on the ground floor, the larger of which will be 40 ft. by 52 ft., and will be set apart as a reading-room. The other apartment is to form the lending library. There will be a gallery round the reading-room, which will be used as a reference library. Part of the basement and the whole of the first floor will be used for science classes. The builder was Mr. Smith, the architect being Mr. J. M. Gething.

Public Baths, Aston Manor, Birmingham.—New public baths have just been erected at a cost of 13,000*l.* in Victoria-road, Aston. The building has a frontage of 80 ft. to Victoria-road. The style adopted is French Renaissance, and the building has been carried out in red terra-cotta, with tile roofs. The ladies' entrance is in the centre. To the right is the first-class men's and to the left the second-class men's entrances. The spaces between the entrances are recessed and finished with a balustrade and cornice. On entering the ladies' department, directly in front is the ticket-office, and to the right opening on to a short corridor are three first-class slipper-baths, while to the left opening on to another corridor are four second-class slipper-baths, a store-room, and an attendant's room. The first-class men's entrance is fitted with a screen similar to that in the ladies' entrance, beyond which is a stone staircase leading to a committee room as well as to a gallery which runs round the swimming-bath. To the right are five slipper-baths, and to the left the ticket office, attendant's room, and the entrance to the first-class swimming-bath. This bath is 90 ft. long by 58 ft. wide, and has a water surface of 78 ft. by 39 ft., being 6 ft. deep at one end and 3 ft. 6 in. at the other. On either side are arranged the dressing-boxes, forty-four in number, with brick divisions, the fronts of which are lined with glazed bricks. To the left of the entrance is a hot room, and to the right a lavatory. At the opposite end, in the centre, is a diving stage, and at either side a spiral iron staircase leading to the galleries, which are 6 ft. wide, and run the whole length of the bath, communicating at the opposite end with a central gallery over the entrance. The galleries are arranged to accommodate about 400 spectators. The promenade round the bath is about 7 ft. wide at the ends and 4 ft. 6 in. at the sides, and is paved with concrete. The tank is lined and paved with white glazed brickwork. The second-class swimming-bath is 72 ft. long by 47 ft. wide, with a water surface 60 ft. by 33 ft., of the same depths as the first-class bath. On three sides of it are arranged dressing-boxes, 56 in number. To the left of the entrance is a lavatory, and on the opposite side a soap bath. The whole of the building, except the committee room, is heated by steam coils, and the water in the swimming-baths by steam. All the corridors and slipper-baths are paved with tiles. Immediately at the rear of the second-class swimming-bath is the engine-house, underneath which is an artesian well 400 ft. deep, from which the water supply of the baths is pumped by a 14-h.p. horizontal engine. This engine also drives a dynamo from which both the baths and the public offices, Witton-road, will be lighted by electricity. In a room leading off the engine-house is an electrical storage battery, containing 60 cells. Adjoining the engine-house is the laundry, fitted with washing-machines, together with a drying-closet heated with steam-pipes. Underneath the laundry is the boiler-house, communicating with the engine-house by a staircase. A subway, 6 ft. in height, commencing at the boiler-house, runs under the entire length of the baths, and terminates at the first-class men's slipper-baths. In this subway all the steam and hot and cold water service pipes, electrical mains, and drains are laid. At the rear of the site, and facing Albert-road, is the superintendent's house. The whole of the corridors and private baths are lighted with Swan-Edison incandescent lamps. The front entrance is lighted by two arc lamps of from 700 to 1,000 candle-power each. Two side lights, with reflectors, fixed about 3 ft. below the water-line, have been introduced in the first-class bath. The baths have been erected from the designs and

under the superintendence of Mr. W. A. Davies, the Engineer and Surveyor to the Board, Mr. Smith acting as clerk of works. Mr. F. N. Stephens, of Aston, is the builder, the other contractors being Mr. J. C. Edwards (Ruabon), for the terra-cotta; Mr. E. Danks (Oldbury), boilers; the Griffin Foundry Company (Birmingham), heating, &c.; Messrs. Piercy & Co., engine and pumps; Mr. Jesse Tildesley (Willenhall), roof and tanks; Mr. J. North (Aston), well; and Messrs. Fowler & Lancaster (Birmingham), electrical installation.

SANITARY AND ENGINEERING NEWS.

THE OLDHAM SEWERAGE SCHEME.—On the 21st ult. Mr. Arnold Taylor, Local Government Board Inspector, sat at the Oldham Town Hall to hold an inquiry regarding an application of the Oldham Corporation to borrow 200,000*l.* for the purposes of their sewerage scheme. Mr. Bidder, Q.C., represented the Oldham Corporation. Mr. Bidder stated that constant threats from the Corporations of Manchester and Salford and the authorities of the Manchester Ship Canal that proceedings would be taken if Oldham did not cease to pollute the Irwell and Mersey by its sewage had caused the Oldham Corporation to face the matter, with the result that the present scheme had been prepared. Evidence was given by the Mayor, the ex-Mayor, Mr. Law, the Engineer, and others. Middleton and the riparian owners opposed the scheme on the ground that the drainage from another area would cause the Wince to flood, and would damage the mills along the banks. A long discussion took place on this, but the Inspector said it did not affect the scheme as a whole.

OLDBURY SEWAGE PURIFICATION WORKS.—On the 5th ult. an inquiry was conducted at the Oldbury Public Buildings by Major-General C. Phipps Carey, R.E., one of the Inspectors of the Local Government Board, with reference to an application made by the Local Board to borrow 5,700*l.* for works of sewage disposal, and 1,100*l.* for street improvements, &c. Mr. H. Bertram Nichols, C.E., of Birmingham, the engineer for the works, explained the scheme, and gave evidence in support of the application. It is proposed to adopt the International Sewage Purification Company's system by passing the sewage after being treated in the tanks through polarite filter-beds. Mr. H. Richardson, Town Surveyor, gave evidence with regard to the loan for street improvements. After the inquiry, the Inspector, accompanied by Mr. Nichols, the Engineer, the Town Surveyor, and some of the members of the Local Board, visited the sewage farm and the various points in the town where the improvements are proposed. There was no opposition to the application.

FOREIGN AND COLONIAL.

FRANCE.—The Jury of Architecture of the École des Beaux-Arts have decided the competition in Architectural History for the First Class, the subject of which was "The Restoration of the façade of the Nymphæum at Nimes. Among seventeen competitors the jury awarded second medals to M. Howard, pupil of M. Laloux, and to M. Arnaud, pupil of M. Pascal.——M. Boussard, architect to the Department of "Postes et Télégraphes," has just completed the new Hôtel des Téléphones in the Rue Gutenberg, which will be opened in a few days.——In connexion with the Art Exhibition at Ghent, the Belgian Government has awarded gold medals to M. Besnard and M. Cordonnier, and honorary diplomas to MM. Bonnat, Carrière, Carolus Duran, Dagnan-Bouveret, Fantin-Latour, Ferrier, Hébert, Jules Lefebvre, Lhermitte, Henri Martin, Pointelet, Rodin, Roll, and Roybet. ——A new Lycée has been opened at Rouen, and a group of scholastic establishments.——Next Wednesday will take place, at the Mont-Parnasse Cemetery, the inauguration of the monument raised to the memory of Ch. Deck, the celebrated ceramist, formerly Director of the Sêvres Manufactory.——Some workmen have discovered, in digging a trench in the Avenue des Gobelins, a stone coffin rudely sculptured, apparently of the Gallo-Roman period. ——A Scandinavian Committee has been formed to offer to M. Pasteur a large bronze medal, the work of the Swedish sculptor Stephan Sinding. On the face is a female figure personifying "Le Nord," inscribing on a stone the titles of the works of M. Pasteur. On the other side are engraved the names of the members of the Committee.——It is announced that the great fortress at Perpignan, known under the name of "Castillet," is no longer to be used as a military prison. The edifice, in red brick, dates from 1319. It is Moorish in style, and was built by the kings of Majorca. It is classed as a "monument historique," and is consequently under the care of the Ministry of Fine Arts. It is much to be wished that the same course should be taken with the Palace of the Popes at Avignon, now used as a barrack, and subject in consequence to treatment which will end in destroying all its archæological and artistic value.——M. Formigé, the architect, has made a design for a columbarium for the cemetery of Père Lachaise. It will be constructed in connexion with four crematories, and will form a double portico divided by a longitudinal wall containing the funeral urns. It will present four faces, and is so designed that each of the four quarters can be built separatel, as needed. The total cost will be 683,200 fr.

BERLIN.—The final competition for the design of the memorial monument to the late Emperor William, which the "Rhine Province" wishes to erect, has been won by Bruno Schmitz in collaboration with the sculptor Hundrieser. The main feature of the monument is to be an equestrian statue of the late Emperor.——Of the twenty-three sets of drawings submitted to the promoters of the great Dresden Railway Terminus competition, two, one by Messrs. Giese & Weidner, of Dresden, the other by Herr Rossbach, of Leipsic, were classed first. The assessors did not consider any design deserving of the first premium of 500*l.* They distributed two prizes of 350*l.* each and five of 100*l.* each.——The competition promoted by the *Berliner Architekten Verein*, with the purpose of obtaining proposals for the site of the International Exhibition, has been won by MM. Cremer & Wolfenstein, of Berlin, who worked in partnership with "Stadtbaurath" Koehn, of Charlottenburg. There were fourteen competitors.——An exhibition of the work of pupils of the arts and crafts school at the "Kunstgewerbe Museum" distinguishes itself from similar ones by the high standard of the exhibits shown.

ROUMANIA.—A competition for the design of a proposed terminus station at Bucharest has been opened. It is an "international" one, and the first premium is 10,000 francs, to which will be added a fee of 100,000 francs for a set of working drawings of the design premiated. There is to be a jury of international experts in lieu of an assessor. Sending-in day is not until May 1, 1893. Certain restrictions are made as to the rendering of the drawings, which have to be drawn to $\frac{1}{200}$ and $\frac{1}{100}$ scales. Full particulars, together with the regulations, are obtainable at the Roumanian Legation, the language used being French.

MISCELLANEOUS.

CHRIST'S HOSPITAL.—Judging from letters we have received, there seems to be a great deal of anxiety on the part of some members of the architectural profession to know when where and how the new schools are going to be built. Nothing is yet settled as to the means to be taken to procure plans, whether by competition or privately; but we are informed that the Council will meet to discuss the question shortly.

CLOCK, PURSTON, NEAR PONTEFRACT.—This important mining village has hitherto been without a public clock until Mr. John Waller, of the Junction Hotel, Purston, and a member of the Board of Guardians, has had one fixed on his new premises at the junction of the Purston, Ackworth, and Pontefract highways. The clock is illuminated and shows the time on two large dials. Messrs. Potts & Sons, of Leeds, are the makers of the clock.

THE "RAPID MIXER."—This is a very simple machine which has been exhibited by Messrs. H. Young & Co. at the Brewers' Exhibition at the Agricultural Hall, and is applicable for any liquids which require mixing. It consists of a conically-shaped vessel, open at both ends, and with projecting blades or floats inside, which is placed vertically in the middle of the tank containing the liquid to be mixed, and rapidly revolved horizontally, when the liquid is drawn in at the narrow end of the cone and thrown out by centrifugal force at the wide end, getting quickly mixed. The advantages are simplicity of action, and the fact that the mixer can be made of such materials as stone-ware or glass, as well as of the more ordinarily-used materials for this kind of implement, so as to be available for liquids which would corrode metal.

THE REGISTRATION OF PLUMBERS.—An examination of candidates for registration by the Plumbers' Company was held on Saturday at the new Borough-road Polytechnic Institute. The examiners were Messrs. Chas. Hudson (Chairman), W. H. Webb and J. Knight (Master Plumbers), and H. Hobbs ("Battersea" Lodge), G. E. Munn ("East London" Lodge), and R. A. Nurse ("No. 1" Lodge), of the United Operative Plumbers' Association of Great Britain and Ireland; and Mr. C. T. Millis, M.I.M.E., Principal of the Educational Department of the Institute. In addition to undergoing a practical test of manipulative skill, each candidate was required to answer a series of questions specially framed with the object of ascertaining his knowledge with reference to the various materials used in the plumbing craft, and the sanitary arrangements inside and outside dwelling houses. Of the twenty-four candidates who presented themselves for examination, we are informed that only three succeeded in satisfying the examiners of their qualifications as practical plumbers. We learn that fifty-four students have joined the plumbing classes which were opened at the Institute on the 3rd ult.

ROBERT BOYLE & SON (LIMITED).—We understand that the directors of Robert Boyle & Son (Limited), ventilating engineers, London and Glasgow, have resolved to recommend a dividend of 12½ per cent., free of Income-Tax, for the year ending September last, after placing to the reserve fund one-sixth of the profits earned and carrying forward 1,386*l.* 4s. 9d. This, we are told, makes the seventh dividend, 12½ per cent. being paid for the last three years, and 12 per cent. for the previous years. The directors propose that the dividend for the current year will balance the subscribed capital of the company, including the ordinary shares held by the vendor, when cent.-per-cent. will have been paid. The business done during the year is stated to have been considerably in excess of the previous year, though that was, we believe, the most profitable year since the formation of the Company. The directors attribute this success, and their consequent ability to pay such a handsome dividend, to their constant study of the requirements of architects, and to the great and ever-increasing demand for the latest improved form of the self-acting air-pump ventilator. The Company announce that they have at present some very important contracts in hand at home and abroad, including the largest ventilating contract they have ever received from the British Government, and a contract of equal magnitude for the Spanish Government. Mr. Robert Boyle, as we lately mentioned, has recently visited the East and Australasia, and has established agencies in Burmah, Queensland, New South Wales, Victoria, South Australia, and New Zealand, arrangements having also been made for the manufacture of the different ventilating and sanitary appliances in each of the Australian Colonies and New Zealand.

ELECTRIC LIGHT FOR PORTSMOUTH.—The foundation-stone of a new electric light station at Portsmouth was laid on the 27th ult., on the site of a music-hall which was burnt down a year or two ago. The system to be adopted is the invention of Professor Garnett, and the work will cost 60,000*l.* It is proposed to light two miles of the sea-wall and four miles of the principal thoroughfares by means of 124 arc lamps, each of 2,000 candle-power. The lighting is expected to be in operation next August.—*Morning Post.*

IMPROVEMENT OF MANX HARBOURS.—The Committee of the Manx Tynwald Court, appointed to consider Governor Walpole's proposals for the improvement of the Manx harbours, met at Douglas on the 27th ult., Mr. Walpole presiding. The sitting was principally occupied by considering various proposals for the protection of Douglas outer harbour. Five plans were submitted by Mr. James Walker, C.E., Engineer to the Isle of Man Harbour Commissioners. The estimated cost ranged from 70,000*l.* to 250,000*l.* No decision was arrived at, consideration of the matter being adjourned. The committee then took up the question of a bridge across Douglas Harbour, but that matter was also adjourned for further inquiry.

THE NEW CHIEF ENGINEER OF THE GREAT WESTERN RAILWAY.—The appointment of Mr. J. C. Inglis, M.Inst.C.E., as engineer-in-chief of the Great Western Railway, has just been ratified.

LIVERPOOL ENGINEERING SOCIETY.—The first ordinary meeting of the nineteenth session of this Society was held at the Royal Institution, Colquitt-street, on the 26th ult., when Mr. Robert E. Johnston, M.Inst.C.E., President, delivered his inaugural address, selecting as his subject "The Development of Railways and the various Improvements in their Construction and Working which have taken place since their introduction." After briefly describing the means of locomotion at the beginning of the century, and the opening of the Liverpool and Manchester Railway, he stated that at the present time the length of the railways of the United Kingdom amounted to no less than 20,073 miles, representing a capital outlay of 897,472,000*l.* The total receipts for the year 1890 were, approximately, 76½ millions, and the working expenses about 41½ millions, leaving a balance of about 35 millions as the profit of one year's working representing an average dividend of 3·90 per cent. per annum on the total capital expended. The lecturer then proceeded to discuss in detail the various improvements which had been effected in the construction of railways since their introduction, in the design of bridges, tunnels, permanent way, and rolling-stock, and in doing this dealt with the construction of the Severn and Mersey subaqueous tunnels. The lecturer pointed out that the practical outcome of the labours of the Managers and Engineers of our railways in their endeavours to render railway travelling as safe as possible had been to reduce the number of fatal accidents in 1890 to one in every 163½ million passengers carried. This, he stated, went a long way to prove the fact that one of the safest places one can be in is a railway train. In conclusion, the lecturer gave a graphic description of the peculiar means adopted in constructing railways with exceptionally steep gradients in Switzerland. A vote of thanks to the President terminated the proceedings.

FIRE-ENGINES AND THE HEIGHT OF BUILDINGS.—We hear that important improvements are about to be made by the London County Council in the working of the Metropolitan Fire Brigade. Hitherto (as we are informed by Messrs. Shand & Mason) the largest land steam fire-engine in use by the Brigade has not exceeded a capacity of 350 gallons per minute, whilst the majority are of 260 gallons only. On account of the increased height of London buildings, however, and for other reasons,

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premium.	Designs to be delivered.
Town Hall	Walsall Corporation..	105*l.* 78*l.* 15*s.* & 52*l.* 10*s.*	*Nov. 12
Large Hospital, Motherwell	Lanark County Council	70*l.* 30*l.*	Dec. 31
Three Small Hospitals, Motherwell	do.	35*l.* 15*l.*	do.
Technical School	Radcliffe Local Board	30*l.* 20*l.* 10*l.*	No date
*Group of Buildings	Met. Asylums Board..	50*l.* 25*l.*	do.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Making-up Roads	Finchley Local Board	F. Smythe	Nov. 7
*Works and Materials	East Barnet Valley Local Board	G. W. Brumell	Nov. 8
*New Bathroom and Workshops	Edmonton Union	T. E. Knightley	do.
Kerbing and Channelling	Droitwich Corp.	B. Godfrey	do.
Strong Room and Offices	Wimbledon Local Bd.	*Official*	do.
Two Terminal Docks, Brunsbuttel and Holtenau	North Sea and Baltic Canal	do.	do.
Waterworks	Allumiere (Rome) Municipality	do.	Nov. 9
Additions to Technical School	Stockport Corp.	do.	do.
Road, Port Talbot	Glamorgan C. C.	do.	do.
Bridge Improvements, Llewitha	do.	do.	do.
Pig Iron, Blaenavon, No. 1	East India Ry. Co.	do.	do.
Sanitary Pipe Sewers	Pudsey Local Board	do.	do.
*Retaining Wall, &c. Newton Abbot Station	G. W. R. Co.	do.	do.
*Making-up and Paving Roads	Fulham Vestry	W. Sykes	do.
*20,000 ft. York Pavement	Mile End Old Town Vestry	J. M. Knight	do.
Roman Cement	Southport Corporation	W. Crabtree	do.
Sewerage Works, &c.	Middleton Corp.	W. Welburn	do.
Farmhouse, &c. Garmouth, Elgin, N.B.	.....	H. J. Mackenzie	do.
Road Materials, &c.	Birkenhead Corp.	T. Chas. Thorburn	do.
Sewerage Works, &c.	do.	do.	do.
Paving, Channelling, &c.	do.	do.	do.
Road Construction	Eccles Town Council..	A. C. Turly	Nov. 10
Granite Road Metal, Flints, &c.	Friern Barnet Loc. Bd.	E. J. Reynolds	do.
Boiler House and Destructor	Sunderland Corp.	*Official*	do.
Gas and Water Mains, &c.	M. Ry. Co.	do.	do.
Iron Castings, &c.	Com. of Irish Lights..	do.	Nov. 11
Methodist Church, Belfast	Committee	J. J. Phillips	do.
Heating Apparatus, Beverley	East Riding Asylum..	A. Beaumont	Nov. 12
Asylum Extension, Beverley	East Riding Union....	do.	do.
Cast-iron Water-pipes (470 tons), &c.	Ashton-under-Lyne, Stalybridge, & Ducklinfield Dist. Waterworks Authorities	G. H. Hill	Nov. 14
Reservoirs, Conduits, &c. Billinge and Winstanley	Pemberton (Wigan) Local Board	Heaton & Ralph	Nov. 15
Temporary Bridge over Clyde, Glasgow	Glasgow Police Com.	Cunningham, Blyth, & Westland	do.
Iron Bridge Work	Secretary of State for India	*Official*	do.
Waterworks	Pisa Municipality	do.	do.
*Broken Granite	Rotherhithe Vestry	do.	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Theatre, Merthyr Tydfil	The Directors	T. C. Wakeling	Nov. 15
*Sewerage Works	Vestry of St. Marcaret & St. John, Westmstr	G. R. W. Wheeler	Nov. 16
*Head Master's House	Governors of Seckford Hospital and Woodbridge School	F. Chancellor	Nov. 17
*Brick Wall, Fence, and Gates to enclose Cemetery	Frith Local Board	*Official*	do.
*Supply of Granite Kerb	Walthamstow Loc. Bd.	do.	do.
*Constructing Sewers	Leicester Corp.	do.	do.
Gasholder	Salford Corporation	do.	do.
Additions to Hotel, Carr-bridge, Elgin, N.B.	Jas. Gilbert	.....	do.
*Wiring Town Hall for Electric Lighting, &c	Hove Commissioners	*Official*	Nov. 18
*Laying Iron Water Mains, &c. &c.	Buckingham Corp.	Baldwin Latham	Nov. 19
*Pair of Cottages, near Dartford	Met. Asylums Board..	A. & C. Harston	do.
Paving Works	Bury (Lanc.) Corp.	J. Cartwright	do.
Sewer Pipes, Fire Bricks, &c.	Gt. Northern Ry. Co. of Ireland	*Official*	Nov. 21
*Brick Sewer	LondonCountyCouncil	do.	Nov. 22
Paving, Channelling, &c. (5 contracts)	Glasgow Police Com.	do.	Nov. 24
*Making-up and Paving Streets	Walthamstow Loc. Bd.	G. W. Holmes	Nov. 25
*Roadmaking Works, Claybury Asylum Estate	LondonCountyCouncil Asylums Committee	G. T. Hine	Nov. 28
*Steel and Iron Bridge	Kingston-on-Thames Corp.	*Official*	do.
Railway Ironwork Supplies	Cheshire Lines Com..	do.	Dec. 8
Drain Pipes, Slates, and Cement	do.	do.	do.
Ironwork, &c.	Adelaide Railway Com.	do.	Dec. 13
Paving Work	Rio de Janeir Municipal Authorities	do.	Jan. 31'93
Waiting and Committee Rooms	Nottingham Union	A. H. Goodall	No date
Chemical Laboratory, &c. Dronfield (Sheffield) Grammar School	.. ..	E. Holmes	do.
Residential Chambers, Whitkirk, Leeds	.....	A. Neill	do.
Cast-iron Pipes	Milford Haven Impt. Commrs.	*Official*	do.
Club Premises, Stalevbridge	.....	Geo. Wilkinson	do.
Eight Houses, Roundhay-road, Leeds	.....	J. Charles & Sons	do.
Four Houses, Dewsbury-road, Leeds	....	C. F. Wilkinson	do.
House and Workshop, Holmfield, Halifax	.....	Petty & Ives	do.
Pair Semi-detached Villas, Howard-place, Carlisle	Jas. Beaty	.....	do.
*Buildings on Woolwich Common	War Department	*Official*	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Clerk of the Works	Poplar, &c. Sick Asy. District Managers	3*l.* 10*s.* per week	Nov. 14
*Assistant Borough Surveyor	Aberdeen Town Coun.	250*l.*	Nov. 21
*Borough Engineer and Surveyor	Birkenhead Corp.	500*l.*, &c.	Nov. 23
*Engineering Assistant	Borough of Sheffield..	.....	No date
Engineer	Bombay Municipality	450 rupees per month	do.

Those marked with an Asterisk (*) are advertised in this Number. *Competition, p.* iv. *Contracts, pp.* iv., vi., *&* viii. *Public Appointments, p.* xx.

the Council recently decided to acquire engines of a more powerful description, and an order has been given to Messrs. Shand, Mason, & Co., for a new double cylinder pattern of engine made by them. The capacity of the new engine is 450 gallons per minute, and the height reached by a jet of 1¼ in. in diameter is 170 ft. New hose has also been ordered of 2¾ in. diameter instead of 2½ in. as now used.

LEGAL.

CASE UNDER THE METROPOLITAN BUILDING ACT.

AT Bow-street Police-court, on Tuesday, Messrs. Holland & Hannen, builders, Duke-street, Bloomsbury, appeared to an adjourned summons charging them with infringing the fourth sub-section of the 27th section of the Metropolitan Buildings Act.

The case was originally heard in September, when Mr. Vaughan reserved his decision.

Mr. Thomas Burton appeared on behalf of the London County Council; Mr. Grain was for the defendant.

In giving judgment Mr. Vaughan said,—This summons has been taken out by Mr. Wallen, the District Surveyor of St. Pancras, against Messrs. Holland & Hannen for irregularities in the construction of a building in Grafton-street, contiguous to the premises of Messrs. Shoolbred, and intended, when completed, to form an extension of those premises, and for non-compliance with a notice requiring such irregularities to be amended. Notice of the intended buildings was sent by the defendants to Mr. Wallen on March 17 last, and in that notice the building was described as a dwelling-house and shop. The building consists of eight stories, and its total height is 87 ft. From the evidence of Mr. Hovenden, the architect, it appears that the basement is to be used for the purpose of packing goods, and the ground floor as a retail shop; that three floors immediately above are to be used as dining-rooms, and that the floors above them are to be used,—one as a scullery or washing place, and the other as a kitchen. A staircase leads from Grafton-street to the top of the buildings, and on each floor is a fireproof landing, from which there is an entrance to the several floors, closed by an iron door. There is a floor which supports the kitchen having iron beams 6 in. deep, 5 in. wide, and 4 ft. apart, with steel cross beams 3½ in. deep and 2 in. wide, 2 ft. apart, filled in with concrete composed of coal [?] breeze and Portland cement of a total thickness of 7 in., increased by a tile pavement 1½ in. thick at the top and by a plaster ceiling at the bottom to a thickness of 9½ in. There are four openings intended for lifts running through this concrete formation. The size of these varies, but one of them is 14 ft. by 12 ft., and none of these openings were shown in the plan submitted to Mr. Wallen, to the best of his recollection. The cubical contents of the whole building are 272,800 ft., exclusive of the staircase, which is 16,656 cubic feet additional. The cubical contents of the rooms above the concrete floor are 62,087 ft. Now, these being the facts, Mr. Wallen complains that the provisions of the fourth sub-section of the 27th section of the Metropolitan Buildings Act have not been observed. By this sub-section it is enacted, "That every warehouse or other building, used either wholly or in part for the purposes of trade or manufacture, containing more than 216,000 cubic feet shall be divided by party-walls in such manner that the contents of each division shall not exceed the above-mentioned number of cubic feet." The first question that arises, then, is this,—Is this a building to be used either wholly or in part for the purpose of trade? That question must be answered in the affirmative. The next question that arises is the definition of a dwelling-house. In the "Imperial Dictionary" a dwelling-house is a house intended to be occupied as a residence, in contradistinction to a place of business, office, or other building, but this they ignored. Is this a building so constructed as to contain more than 216,000 cubic feet, and, if it does, is it so divided by party-walls as that each division shall not contain more than that number of cubic feet? In no sense can it be said that the statutory provision has been complied with. I come to the conclusion that the complaint in this summons is well founded, and I am, therefore, compelled to make an order that the irregularities complained of shall be amended.

Mr. Vaughan decided to allow 6*l.* 6*s.* costs, and, on the application of Mr. Grain, agreed to state a case.—*Times.*

MEETINGS.

FRIDAY, NOVEMBER 4.

Architectural Association.—Mr. W. Young on "The Application of an Architectural Education." 7.30 p.m.

Junior Engineering Society.—Presidential Address by Dr. John Hopkinson. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor A. Wynter Blyth on "Diseases of Animals in relation to Meat Supply; Characteristics of Vegetables, Fish, &c., unfit for Food." 8 p.m.

MONDAY, NOVEMBER 7.

Royal Institute of British Architects. — Opening Address of the Session, by the President, Mr. J. Macvicar Anderson. 8 p.m.

Liverpool Architectural Society.—Mr. T. Mellard Reade on "Questions of the Hour." 6.30 p.m.

TUESDAY, NOVEMBER 8.

Institution of Civil Engineers. — (1) Address by the President, Mr. Harrison Hayter. (2) Presentation of Medals, &c., awarded last session. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. Shirley F. Murphy on "Infectious Diseases and Methods of Disinfection." 8 p.m.

WEDNESDAY, NOVEMBER 9.

Liverpool Engineering Society. — Mr. Arthur J. Maginnis on the "Development of the Machinery of Atlantic Liners." 8 p.m.

THURSDAY, NOVEMBER 10.

Institution of Electrical Engineers.—Discussion on Mr. James Swinburne's paper on "The Problems of Commercial Electrolysis." 8 p.m.

Institution of Civil Engineers.—Students' visit to the Tottenham and Forest Gate Railway. Train leaves Liverpool-street at 9.58 a.m. for Forest Gate.

FRIDAY, NOVEMBER 11.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. F. J. Sykes on "General Powers and Duties of Inspectors of Nuisances." 8 p.m.

Bradford Historical and Antiquarian Society.—Dr. Leadman, F.S.A., on "A Tour through Yorkshire."

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

14,137.—IMPROVED PIPE-JOINT: *A. Turnbull.*—According to this invention, a joint is made of two flanges connected by corrugated steel and rivetted at their outer circumference. As the steam-pipe expands or contracts, the flexible steel-plate allows the flanges to come closer together or to go further apart without any injury being done to the pipe.

12,282. — SLOW-CLOSING VALVES FOR W.C.'S: *J. F. Glover and another.*—Several improvements in the ordinary valve are made with a view of avoiding the usual difficulties of choking or inefficient egress for water. Although simple in work the details are such as could only be described or set out by drawings.

9,779.—WATER-SUPPLY TAPS: *F. Heckel.*—This is an automatic water-supply tap, with a chamber which fills through the bore in the gauge or regulator, whereby a rubber diagram which has been raised from its seat by the pressure of water receives a counter pressure, which consequently forces it into its seat again, thus closing the tap after a certain quantity of water has run out.

7,895.—PAVING BRICKS, TILES, &C.: *T. P. Baylis.*—An improvement is made by having the paving brick or tile grooved on one side and end, and on the other side and end is fitted a tongue, so that each brick or tile shall dovetail or fit in each other so as to cause the paving to be always an even surface to secure them from rocking or tipping out of their original position, and thereby avoid the splashing up in wet weather. The proportions of the tongue and groove is also subject matter of the specification.

589.—PREVENTING PIPES BURSTING DURING FROST: *J. Phillips.*—This object is attained by emptying the pipes during frost by means of a valve fixed in the cistern or elsewhere, and adjustable from any part of the building.

15,281.—DECORATIVE ARTIFICIAL STONE: *W. F. Thomas.*—This refers to a process of inserting from back to front, or *vice versâ*, various coloured granites or marbles into artificial stone. The whole forms one solid block, as movable metal or other moulds are used, and floral, geometrical, and other patterns are made in conjunction with the formation of the solid slab.

NEW APPLICATIONS FOR LETTERS PATENT.

October 17.—18,522, P. Mooney, Automatic Flush Water-closets.

October 18.—18,603, F. Lynde, Water-closet Flushing Cisterns.—18,609, H. and W. Jennings, Square Drill.—18,617, E. Smith and S. Perry, Chimney-cowls.—18,618, A. Egginton, Sash-fasteners.—18,619, T. Robinson, Band-saw Machines.—18,627, J. Thorrold and J. Kendrick, Fastening for Door-knobs.—18,663, M. Classen, Jambs for Doors and Windows.—18,670, A. Boult, Fire-grates.

October 19.—18,700, T. Poole and Woodhouse & Rawson, United, Limited, Electrical Ceiling Roses.—18,735, H. Lake, Manufacture of Paint or Cement.—18,754, T. Thorp, Drain-pipes, &c.

October 20.—18,780, J. Burley, Sash-fasteners.—18,785, G. Smith and J. Parrott, Secret Bolt for doors, gates, &c.—18,803, K. Alsdorff, Fireproof Walls and Ceilings.

October 21.—18,881, W. Greaves, Open Fire Ranges or Stoves.—18,903, C. Reinhardt, Swinging Windows.—18,912, E. Whitehead, Window-sash Fasteners.

October 22.—18,933, A. Hinde, Hydraulic Lifts or Hoists.—18,984, R. Gribbon, Preventing Window-sashes from Rattling or Shaking.—19,009, J. Thomlinson, Manufacture of Non-efflorescent White Cements from Calcined Sulphate of Lime.

PROVISIONAL SPECIFICATIONS ACCEPTED.

16,151, E. Harvey, Water-closets.—16,207, H. Owens, Lock Crank for use in door locks and latches.—16,600, W. Westlake, Door Holder.—16,612, R. Cartwright, Water-closet Apparatus,—16,785, A. Jarrord, Hinge.—17,073, R. Rigby, Graining Comb.—17,185, W. Oates, Slow-combustion Stoves and other Fireplaces and Ranges.—17,340, M. Frensdorff, Sanitary Coverings for Water-closet Seats.—17,699, R. Coates, Automatic Gate or Door Stop, for use where double gates or double doors are required.—17,810, E. Jumeau, Decorative Plaques, Tiles, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

18,228, A. Churchman and W. Dejerdon, Portable Bench for Wood or Metal Workers.—22,209, J. & A. Duckett, Water-closets.—22,322, W. Jacques, Fire-exit Door Lock and Alarm.—9,093, W. Allen, Sash-fastener.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

OCTOBER 18.—*By Humbert, Son, & Flint* (at Watford): "The Colney Butts Estate," Watford, seventy-two plots of f. land, 3,242*l.*

OCTOBER 20.—*By G. B. Smallpeice* (at Woking): Two f. cottages, Woking, r. 33*l.* 12*s.*, 360*l.*

OCTOBER 24.—*By Beard & Son*: 1, Hamilton-ter., St. John's Wood, u.t. 31 yrs., g.r. 2*l.*, r. 80*l.*, 700*l.*; 213, Cornwall-rd, Notting Hill, u.t. 72 yrs., g.r. 10*l.* 10*s.*, 305*l.*; 130, Portobello-rd., u.t. 51 yrs., g.r. 8*l.* 8*s.*, 410*l.*; 78, Cornwall-rd., Bayswater, u.t. 77 yrs., g.r. 10*l*, 370*l.*—*By Towers, Ellis, & Co.*: 23, Alexander-st., Bayswater, u.t. 56 yrs., g.r. 12*l.*, r. 100*l.*, 900*l.*—*By Puttick & Puttick*: 2, Queen's-sq, Bloomsbury, u.t. 807 yrs., g.r. 6*l.*, r. 63*l.*, 800*l.*—*By Debenham, Tewson, & Co.* (at Pinner): "The Royston-Pk. Estate, Pinner, thirteen plots of f. land, 1,940*l.*

OCTOBER 25.—By *Collier & Henderson*: "Elm House," Mitcham, f., r. 31*l.* 4*s.*, 425*l.*; 1, 2, and 3, Tubb's-alley, f., 220*l.*; a freehold cottage, 135*l.*; 1 to 5, Railway-cottages, f., 450*l.*; the lease of 5, Bennett-st., Oxford-st., u.t. 19 yrs., r. 150*l*, 70*l.*—By *G. B. Smallpeice*: 106 and 108, St. Katherine's-rd., Notting Hill, u.t. 41 yrs., g.r. 12*l.*, 205*l.*; 12, Tavitonst., Gordon-sq, sold before auction.—By *C. W. Davies*: 5 and 7, Cheshire-st., Bethnal Green, f., r. 64*l.*, 670*l.*—By *Bean, Burnett, & Co.*: 1 to 7, Junction-ter., Acton, f., 975*l.*; 73, 75, and 77, Glebe-st., Turnham Green, u.t. 76 yrs., g.r. 12*l.*, 415*l.*; 12, Belsize-pk., Hampstead, u.t. 59 yrs., g.r. 20*l.*, r. 110*l.*, 1,080*l.*—By *Debenham, Tewson, & Co.*: "Denston House," Cuddesdon, Oxon., and 12 acres, f., 3 300*l.*—By *W. Hall*: 35 and 41, Regent-sq., King's Cross, f., 1,795*l.*—By *F. Jolly & Co.*: 240, Richmond-rd., Hackney, u.t. 53 yrs., g.r. 8*l.*, r. 65*l.*, 490*l.*; 141, 143, and 151, Ernest-street, Mile End, u.t. 72 yrs., g.r. 12*l.*, 500*l.*

OCTOBER 26.—By *A. Watson*: 1, Headstone-rd., Harrow, f., r. 35*l.* 16*s.*, 425*l.*; 2 and 3, Headstone-rd., f., r. 51*l.*, 700*l.*—By *R. Tidey & Son*: 95 and 97, Mortimer-rd., Kingsland, u.t. 23 yrs., g.r. 15*l.* 8*s.*, r. 92*l.*, 425*l.*—By *Mark Lidell & Son*: 1, 2, and 3, Bridlington-villas, Leytonstone, f., r. 8*l.*, 1,270*l.*; 13 and 15, Stork-rd., Forest Gate, u.t. 88 yrs., g.r. 5*l.*, 5*s.*, 250*l.*; 42 and 44, Edward's-rd., Mile-end, u.t. 43 yrs., g.r. 9*l.*, 260*l.*; 101 and 103, Knapp-rd., Bromley-by-Bow, u.t. 70 yrs., g.r. 7*l.*, 300*l.*; 240, Victoria Park-rd., Hackney, u.t. 61 yrs., g.r. 6*l.* 19*s.*, 4*d.*, r., 33*l.*, 320*l.*; 9, Tilletts Cottages, Leytonstone, f., 100*l.*; 3 and 4, Morley-road, Leyton, u.t. 90 yrs., g.r. 10*l.* 10*s.*, 200*l.*—By *Herring, Son, & Daw*: No. 13, "The Elm," Streatham-hill, f., with grounds, 3,250*l.*; f.g.r. of 15*l.*, reversion in 39 yrs., 535*l.*; ditto of 20*l.*, ditto in 38 yrs., 755*l.*

OCTOBER 27.—By *Debenham, Tewson, & Co.*: "The Bricklayers' Arms," public-house, Southampton-st., Camberwell, f., r. 120*l.*, 4,200*l.*; Freehold rent of 50*l.*, Dowlas-st., reversion in 15 yrs., 1,090*l.*; "The Crescent Arms," Southampton-st., r. 60*l.*, reversion in 29 yrs., 2,500*l.*; f.g.r of 315*l.* 10*s.*, reversion in 69 yrs., 7,990*l.*; f.g.r. of 151*l.* 1*s* 6*d.*, Rainbow-st., &c., reversion in 69 yrs., 3,820*l.*; f.g.r. of 74*l.* 19*s.*, Bonsor-st., reversion in 69 yrs., 1,800*l.*; f.g.r. of 185*l.* 11*s.*, Rainbow-st., reversion in 69 yrs., 4,650*l.*; f.g.r. of 403*l.* 10*s.*, Coleman-rd., reversion in 69 yrs., 9,900*l.*; f.g.r. of 42*l.*, Wells-st., reversion in 69 yrs., 1,090*l.*; f.g.r. of 6*l.*, Southampton-st., reversion in 47 yrs., 150*l.*; f.g.r. of 5*l.* 4*s.*, Peckham-grove, reversion in 47 yrs., 130*l.*; f.g.r. of 37*l.*, Peckham-grove, reversion in 71 yrs., 940*l.*; f.g.r. of 7*l.* 5*s.*, Peckham-grove, reversion in 39 yrs., 200*l.*; f.g.r. of 23*l* 7*s.* Dowlas-st., reversion in 69 yrs., 570*l.*; Nos. 1 to 15 (odd) 21 to 29 (odd), 45, 47, 53 to 63 (odd), 2 to 10 (even), 22 to 30 (even), 56 and 58, Coleman-rd, f., 9,030*l.*; Nos. 83 to 95 (odd) and 97 to 119 (odd), Wells-st, f., 6,520*l.*; Nos. 191, 193, 197, and 199, Southampton-st., f., 1,600*l.*; Nos. 28, 30, 32, 36 to 56 (even), and 60 to 63 (even), Peckham-grove, f., 7,750*l.*—By *Rutley, Son, & Vine*: 47, Carlton Vale, Maida Vale, u.t. 56 yrs., g.r. 5*l.*, 450*l.*; 3, Mecca Villas, Hornsey, u.t. 96 yrs., g.r. 5*l.*, 220*l.*—By *Stimson & Sons*: F.g.r. of 40*l.*, High-st., Peckham, reversion in 6 yrs., 1,170*l.*; f.g.r. of 28*l.*, Victoria-pl., reversion in 10 yrs., 500*l.*; f.g.r. of 6*l.*, Victoria-pl., reversion in 21 yrs., 105*l.*; f.g.r. of 5*l.* 5*s.*, Victoria-pl., reversion in 2 yrs., 430*l.*; f.g.r. of 7*l.*, Pomeroy-st., reversion in 49 yrs., 190*l.*; f.g.r. of 2*l.* 14*s.* and 2*l.* 10*s.*, Picton-st., Camberwell, reversions in 12 and 14 yrs., 400*l.*; 59, 61, and 63, Picton-st., f., 445*l.*; f.g.r. of 8*l.* 10*s.*, East-st., Barking, reversion in 78 yrs., 200*l.*; f.g.r. of 6*l.*, East-st., reversion in 70 yrs., 140*l.*; 25 and 27, Brixton-rd., Brixton, u.t. 11 yrs., g.r. 30*l.*, 310*l.*; 22 to 32, Hibbert-st., Battersea, u.t. 50 yrs., g.r. 12*l.*, 550*l.*; 14, Vaughan-rd., Camberwell, u.t. 49 yrs., g.r. 3*l.*, 305*l.*; 58, Trafalgar-rd., Old Kent-rd., u.t. 40 yrs, g.r. 5*l.*, 230*l.*; 25 to 30, Charles-st., Westminster Bridge-rd., f., 810*l.*—*By C. C. & T. Moore*: 18 and 19, Manning-st., Limehouse, f., 165*l.*; 33, Poole-rd., Hackney, u.t. 53 yrs., g.r. 5*l.* 5*s.*, r. 30*l.*, 285*l.*; 18 to 21, Longfellow-rd., Mile End, f., 1,200*l.*; 1 to 7, Cleveland-st., f., 1,365*l.*; 19, 21, and 23, Claverley-st., u.t. 51 yrs., g r. 14*l.* 12*s.* 6*d.*, 360*l.*; 28 and 30, Blakesley-st., Commercial-rd., u.t. 5 yrs., g.r. 11*l.*: 5 and 7, Exmouth-st., u.t. 1 year, g.r. 8*l.*; and 21, Jamaica-st., u.t. 1 year, g.r. 4*l.*, 85*l.*; 7, 8, 9, and 9A, Wellclose-sq., St. George's-in-East, f., 1,925*l.*; 38, Wellclose-sq., f., 250*l.*; 12, Palmer-st., Spitalfields, f., 190*l.*; 99 and 101, Jamaica-st., Commercial-rd., u t. 17 yrs., g.r. 8*l.*, r. 56*l.*, 305*l.*—By *A. G. Thomson & Co.*: Two f. cottages, High-st., Hampton Wick, r. 25*l.*, 350*l.*—By *Dyer, Son, & Hilton*: "Park Lodge," Hervey-rd., Blackheath, u.t. 67 yrs., g.r. 16*l.*, 1,000*l.*—By *Newbon & Co.*: 72, Packington-st., Islington, u.t. 44 yrs., g.r. 6*l.* 10*s.* r. 48*l.*, 410*l.*; 108, Drayton-pk., Highbury, u.t. 84 yrs., g r. 8*l.*, r., 40*l.*, 300*l.*; 13 and 21, Stavordale-rd., u.t. 84 yrs., g.r. 16*l.*, 605*l.*; 2, Margaret-st., Oxford-st., u.t. 32 yrs., g.r. 8*l.*, r. 80*l.*, 745*l.*; 24 and 25, Upper Ogle-st., u.t. 35*l.*, g.r. 14*l.*, r. 140*l.*, 980*l.*

OCTOBER 28.—By *A. W. Taylor & Co.*: "Fieldholme," Queen's Ride, Barnes Common, u.t. 80 yrs., g.r. 20*l.* 5*s.*, 1,210*l.*—By P. *Hodson*: 99, Rosoman-st., Clerkenwell, u.t. 23 yrs., g.r. 15*l.*, r. 38*l.*, 50*l.*—By *Norton, Trist, & Gilbert*: "The Mount," Shere, Surrey, and 2¼ acres, f., 2,000*l.*; four freehold cottages, 870*l.*; a plot of freehold land, 1½ acres, 400*l.*—By *W. Bradley*: 84, Sydney-rd., Hornsey, u.t. 91 yrs., g.r. 6*l.* 6*s.*, r. 28*l.*, 195*l.*; 1 and 2, Laurel-gardens, Greenwich, u.t. 14 yrs., g.r. 25*l.*, 20*l.*; 66, Pelton-rd., u.t. 15 yrs., g.r. 3*l.* 17*s.*, 80*l.*; 50 to 56 (even), Lower Chester-st., u.t. 26 yrs., g.r. 3*l.*, 310*l.*; 58, Lower Chester-st., u.t. 26 yrs., g.r. 1*l.* 12*s.*, 140*l.*; 36, Marlborough-st., and 29, Hoskins-st., u.t. 18 yrs., g r. 15*l.*, 55*l.*; 7, Albert-place, Charlton, u.t. 11 yrs., g.r. 1*l.* 17*s.* 6*d.*, 95*l.*; 155 and 157, Bidder-st., Canning Town; and a plot of land, f., 405*l.*; 180, 182, and 184, Bidder-st.; and a plot of land, f., 520*l.*; 75 to 80, Stephenson-st., f., 1,180*l.*

[Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g r. for ground-rent; r. for rent; f. for freehold; c. for copyhold: l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	ton	9/0/0 — 0/0/0
Teak, E.I...	load	9/10/0 — 15/0/0
Sequoia, U.S. ft.cu.		2/4 — 3/6
Ash, Canada	load	2/10/0 — 4/0/0
Birch, do.		3/5/0 — 4/10/0
Elm, do.		3/10/0 — 4/15/0
Fir, Dantzic, &c.		1/18/0 — 3/10/0
Oak, do.		3/0/0 — 5/5/0
Canada		5/10/0 — 7/0/0
Pine, Canada red		2/10/0 — 3/10/0
Do. yellow		2/10/0 — 5/0/0
Lath, D'antzic, fath		5/0/0 — 6/0/0
St. Petersburg		5/0 0 — 7/0 0
Deals, Finland 2nd & 1st std		100 — 7/10/0 — 9/10/0
Do. 4th & 3rd		7/0/0 — 8/0/0
Do. Riga		6/10/0 — 8/0/0
St. Petersburg, 1st yellow		10/10/0 — 14/10/0
Do. 2nd yellow		8/0/0 — 9/10/0
Do. white		7/0/0 — 9/10/0
Swedish		7/0/0 — 16/0/0
White Sea		8/0/0 — 17/0/0
Canada, Pine 1st		20/0/0 — 26/10/0
Do. do. 2nd		14/10/0 — 16/0/0
Do. do. 3rd, &c.		7/10/0 — 10/0/0
Do. Spruce. 1st		8/16/0 — 11/0/0
Do. do. 3rd & 2nd		6/5/0 — 8/0/0
New Brunswick		6/10/0 — 7/0/0
Battens, all kinds		8/10/0 — 15 10 0
Flooring Boards, sq., 1 in. prep. 1st		0/8/0 — 0/13/0
Do. 2nd		0/7/0 — 0/10/0
Other qualities		0/3/0 — 0/7/6
Cedar, Cuba	ft.	3½ — 4½
Honduras, &c.		3½ — 4
Mahogany, Cuba.		4½ — 6½
St. Domingo, cargo av		4 — 2/0
Mexican do. do		4 — 5
Tobasco do. do		5 — 7
Honduras do..		5 — 6½
Box, Turkey	ton	4/0/0 — 12/0/0
Rose, Rio		10/0/0 — 20/0/0
Bahia		9 0 0 — 15/0/0
Satin, St. Domingo	ft.	0/0/7 — 0/1/3
Porto Rico		0/0/7 — 0/1/6

TIMBER (*continued*).		
Walnut, Italian..		0 0 3½ — 0/0/7
METALS.		
IRON—Pig, in Scotland	ton	2/1/3 — 0/0/0
Bar, Welsh, in London		5/17/6 — 6/0/0
Do. do. at works in Wales		5/7/6 — 5/10/0
Do. Staffordshire, in London		6/5/0 — 6/15/0
COPPER—British, cake and ingot		49 0/0 — 49/10/0
Best selected		50/0/0 — 50/10/0
Sheets, strong..		58/0/0 — 0/0/0
Chili, bars		45/10/0 — 45/17/6
YELLOW METAL	lb.	0/0/5 — 0/0/5½
LEAD—Pig, Spanish	ton	10/2/6 — 10/5/0
English, com. brands		10/7/6 — 10/12/6
Sheet, English, 3 lbs. per sq. ft. and upwards		11/10/0 — 8/0,0
Pipe		12/0/0 — 0/0/0
ZINC—English sheet	ton	22/15 0 — 0/0/0
Vieille Montagne		23/5/6 — 0/0/0
TIN—Straits		94/0/0 — 94/10/0
Australian		94/10/0 — 95 0/0
English Ingots		98/0 0 — 98/10 0
Banca		95/10/0 — 95/15/0
Billiton		95/0/0 — 95/10/0
OILS.		
Linseed	ton	18/15/0 — 0/0/0
Cocoanut, Cochin		24/10/0 — 0/0/0
Do. Ceylon		23/10/0 — 0/0/0
Palm, Lagos		24/10/0 — 0/0/0
Rapeseed, English pale		25/0/6 — 0/0/6
Do. brown		23/0/0 — 0/0/0
Cottonseed ref...		18/10/6 — 0/0/0
Oleine		20/10/0 — 21/0/0
Lubricating, U.S.		4/0/6 — 5/0/0
Do. refined		5/10/0 — 12/0/0
TAR—Stockholm	barrel	0/17/6 — 0/18/6
Archangel		0/12/6 — 0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 12 *noon on Thursdays*.]

ASPATRIA (Cumberland).—For the erection of two ante-rooms, boiler-house, &c., at the Public Hall, for the Aspatria Public Hall Company. Mr. Robert Bell, architect, Richmond-hill, Aspatria. Quantities by the architect:—

Lancelot Ferguson	£147 10 0	William Studdome & Sons, Aspatria*	£135 13 6
Jas. Davidson & Sons	137 17 6		

* Accepted.

BARNET.—For road-making works, Strafford-road, for the Local Board. Mr. W. H. Mansbridge, Surveyor, 140, High-street, Barnet:—

Killingback	£189 0 0	Bell	£145 0 0
Adams	174 0 0	Pye	143 0 0
Jackson	168 2 10	Bloomfield, Tottenham (accepted)	139 0 0
Nickolls	145 10 0		

BARNET.—For about 511 yards run of 9-in. pipe sewers with manholes, &c., for the Rural Sanitary Authority. Mr. W. H. Mansbridge, Surveyor, 140, High-street, Barnet:—

West Barnet Sewers.

Waite	£440 15 0	Bell	£312 0 0
Adams	368 0 0	Bloomfield	303 0 0
Butcher	333 0 0	Kellett	300 0 0
Jackson	323 0 0	Nickolls, Wood-green*	297 10 0
Killingback	313 0 0		

* Accepted.

BARNSLEY.—For the construction of an outfall sewer, &c., Hoyland Common, for the Hoyland Nether Local Board. Mr. William Farrington, Surveyor, Town Hall, Hoyland Nether, near Barnsley:—

George White	£677 6 0	James Trippett	£418 18 4
Frank Eyre	477 15 9	George Hall, Sheffield*	416 0 0
Dearden & Williamson	426 13 0		

* Accepted.

BELFAST.—For the erection of a quay-wall, Lagan Bank-road, for the Corporation. Mr. J. C. Bretland, M.Inst.C.E., City Surveyor. Quantities by Mr. W. H. Stephens, Donegal-place, Belfast:—

E. Manisty	£7,527 11 9	H. & J. Martin, Ltd.	£4,977 0 0
R. C. Brebner	6,566 10 7	Jas. Henry	4,891 0 0
W. Gradwell	6,000 0 0	Workman & Co., Belfast (accepted)	4,850 0 0
Jno. Jourdan	5,850 0 0		

BUCKFASTLEIGH (Devon).—For taking-up and relaying 312 ft. lineal, and providing and laying 520 ft. lineal, of 9 in. pipe sewer, &c., Buckfastleigh, for the Union Rural Sanitary Authority. Mr. C. G. S. Acock, Surveyor, Bridgetown, Totnes:—

Furneaux	£183 0	Shaddock	£75 0
Selwood, Totnes*	75 10		

* Accepted.

CROFT-WITH-SOUTHWORTH (Lancashire).—For the erection of school-buildings, for the School Board of Croft-with-Southworth. Mr. James Cawthorne, architect, Croft, Warrington. Quantities by Mr. James Cawthorne:—

Isaac Talbot & A. Pomfret	£285 10	Thomas Balmer, Leigh, Lancs (accepted)	£210 0
Joseph & John Dainlith	267 0		

DURHAM.—For the construction of sewerage works, High Pittington, for the Rural Sanitary Authority. Mr. G. Gregson, Surveyor, 43, Western-hill, Durham. Quantities by the Surveyor:—

Thomas Dixon	£133 14	John Carrick, Durham*	£122 0

* Accepted.

ELLAND (Yorks).—For sewering, channelling, paving, &c., Beech-street, for the Local Board. Mr. George Hepworth, Surveyor, 11, Bradford-road, Brighouse, Halifax:—

Belfield & Barnes	£501 6 4½	James Brook, Lindley (accepted)	£465 0 0
Harrison Barraclough	482 16 2		

ENBORNE.—For works of restoration and new north aisle at Enborne Parish Church, near Newbury, Berks. Mr. James H. Money, architect, Newbury. Quantities by Messrs. R. L. Curtis & Sons, 119 and 120, London-wall, Moorgate-street, E.C.:—

Wooldridge & Son	£2,271	George Elms, Marsh Benham (accepted)	£2,109
W. G. Adey	2,150		

GREAT YARMOUTH.—For laying drains, &c., at the workhouse, for the Board of Guardians. Mr. A. S. Hewitt, architect, 10, Regent-street, Great Yarmouth:—

R. Eastoe	£355	M. Barnard	£287
Cockrill & Son	339	G. Beech, Yarmouth*	275

* Accepted.

LINCOLN.—For the erection of a farmhouse at South Carlton, near Lincoln, for the Right Hon. Viscount Oxenbridge. Mr. W. Watkins, architect, Lincoln:—

M. Otter & Co.	£1,139	H. S. & W. Close	£1,082
S. & R. Horton	1,125	C. Sands (accepted)	1,043
W. Wright & Sons	1,118	[All of Lincoln.]	

LINCOLN.—For the erection of technical workshops at the School of Science and Art, Lincoln. Mr. W. Watkins, architect, Lincoln:—

S. & R. Horton	£965	W. Wright & Sons	£940
H. S. & W. Close	948	M. Otter & Co. (accepted)	848
[All of Lincoln.]			

LONDON.—For alterations to the "Old Red Cow," Long-lane, Smithfield, for Mr. W. Harwood. Messrs. Dickinson & Paterson, architects, 5, John-street, Adelphi, W.C.:—

Plummer	£873	Dearing & Son	£610
Bush & Sons	809	Breeze	575
Burman & Son	650		

LONDON.—For the erection of a shelter, Blackfriars, for the Salvation Army. Mr. Alex. Gordon, architect:—

G. Picton	£1,827 10	J. Billins	£1,272 7
T. Hooper	1,550 0	Martin & Co.	1,143 0
W. Tout	1,416 0	G. Brittain	1,066 10
F. Coxhead	1,349 0	T. Morgan	840 0

LONDON.—For repairs, painting, papering, &c., at the Islington Relief Offices, Highbury Mews, N., for the Guardians of the Poor of the Parish of St. Mary, Islington. Mr. William Smith, architect, 65, Chancery-lane, W.C.:—

Bates & Co.	£410 0 0	Houghton & Sons	£202 0 0
Rhodes	310 10 0	Stewart & Co.	197 13 4
Pierce	293 0 0	Marchant & Hurst	197 0 0
Richards	274 13 0	Matthews Bros.	192 0 0
Bull	273 0 0	Fagg	189 0 0
Lawrence	243 0 0	Shaw	189 0 0
Pedrick	235 11 0	Stevens Bros.	178 0 0
Larke & Son	230 0 0	Dainton	173 0 0
Jones & Tresise	220 0 0	Riley	168 3 9
Ward & Lamble	213 0 0	Kenney	165 0 0
Dickson	212 15 0	Derby	149 0 0
Langham	205 0 0	White & Son	149 0 0
Sheffield Bros.	203 0 0	Seed	140 0 0

LONDON.—For pulling down and rebuilding premises, Nos. 78, 80, and 80A, Broadway, Stratford, E., for Mr. J. R. Roberts. Mr. J. Kingwell Cole, architect. Quantities by Mr. Edward S. Mansergh, 28, Mount-street, Grosvenor-square, W.:—

A. Reed	£5,896	W. J. Maddison	£5,300
Coxhead	5,500	Spencer & Co.	5,150
G. H. & A. Bywaters	5,426	S. Chafen	5 138
G. S. S. Williams & Son	5,394	J. & H. Cocks	4,898
G. Morter	5,360	B. E. Nightingale	4,893
Harris & Wardrop	5,347	J. Osborn & Sons	4,828

LONDON.—For the erection of new premises at Newington Green, N., for the Mildmay Radical Club and Institute. Mr. Alfred Allen, architect, 87, Old-street, St. Luke's, E.C.:—

Britton	£4,826 2	Battley	£3,923 0
Dearing	4,286 0	Anley	3,875 0
Co-operative Builders	4,146 5	Lawrence & Sons	3,870 0
Killby & Gayford	4,130 0	Shurmur	3,690 0
Dove Bros.	4,100 0	G. S. Archer	3,350 0

LONDON.—For re-instating No. 15, Market-terrace, Wood Green, N., after fire, for Mr. W. J. Palmer. Mr. John E. Pinder, architect and surveyor, Bridge House, South Tottenham:—

Knight & Son	£435	A. Monk	£399
F. Voller	433	H. Say, Wood Green*	348

* Accepted.

LONDON.—Accepted for kerbing, channelling, paving, &c. Knighton Park-road, for the Lewisham Board of Works. Mr. John Carline, Surveyor:—

John Mowlem & Co., Millbank, S.W.	£339 0 0

LONDON.—For fittings to baker's shop, No. 6, Symons-street, Sloane-square, S.W. Messrs. Pooley & Follett, architects, 21, John-street, Adelphi, W.C. :—

Charles Spreckley	£360 10	W. H. Clarke, 127, Gray's	
Drew & Cadman	295 0	Inn-road, W.C.*	£278 16
J. W. Meller	283 0	* Accepted.	

LONDON.—For pulling down and rebuilding No. 43, Queen Anne-street, W., for Mr. George Maddox. Messrs. George & Ralph Low, architects, 10, Basinghall street, E.C. No quantities :—

H. B. Oldrey	£2,100	Hilder & Edge, Great	
J. Edgar	1,960	Pulteney-street*	£1,850
A. G. Burton	1,949	* Accepted.	

LONDON.—For the extension of the Poplar and Stepney Sick Asylum, Devon's-road, Bromley-by-Bow, E., for the Managers of the Poplar and Stepney Sick Asylum District. Messrs. A. & C. Harston, Architects, 15, Leadenhall-street, E.C. Quantities supplied :—

Reed, Blight, & Co.	£31,958	J. Holland, 163, Brunswick-	
Shillitoe & Son	31,400	road, Poplar, E.*	£25,750
Leslie & Co.	28,499		

* Accepted as modified and reduced at £23,794.

MIDGLEY (Yorks).—Accepted for work in the erection of seven through houses, approach road, garden, and boundary walling, &c., Thorney-lane, Midgley. Mr. T. L. Patchett, architect, Halifax :—

Excavator, mason, and bricklayer (exclusive of stone exterior, and foundation walls, ashlar, landings, and flagging)—Thos. Pickles, Midgley	£680 0
Carpenter and joiner—Edwin Marsland, Booth	286 0
Plumber and glazier (exclusive of water and gas supply)—Wm. Alderson, Luddenden	40 0
Slater and plasterer (exclusive of grey slates)—Thos. Alderson, Luddenden	106 10

OGMORE VALE (Glamorganshire).—Accepted for the construction of sewerage works, Gareg-road, for the Ogmore and Garw Local Board. Mr. H. Dawkin Williams, Surveyor, Blackmill, Ogmore Vale :—

David Jenkins, Oxford Joinery Works, Swansea £487 0 0

PONTYPOOL.—For the erection of six houses, Cwmffrwdoer, for Mr. William Bush. Mr. George John Jee, C.E., architect, Pontypool :—

Wm. Harris	£1,159 10 0	Morgan & Evans	£960 0 0
Freeman & Hardy	960 0 0	A. H. Bailey, Pontnew-	
W. & A. Davies	960 0 0	ynydd (accepted)	948 0 0

[Architect's estimate, £960.]

SOUTHAMPTON.—For supplying and fixing fittings at the Hartley Institution, for the Hartley Council Mr. W. B. G. Bennett, Surveyor, Municipal Offices, Southampton :—

J. W. Rowland	£337 13	Roe & Co., Southampton*	£327 10
		* Accepted.	

SURBITON.—For the erection of a private residence in St. Andrew's-square, for Mr. L. J. S. Wood. Mr. R. Lano Pearce, architect, 100c, Queen Victoria-street, London, E.C. :—

J. H. Jarvis	£957	Adkins Bros.	£897
French & Ellwood	950	Archibald Brown & Co.	819

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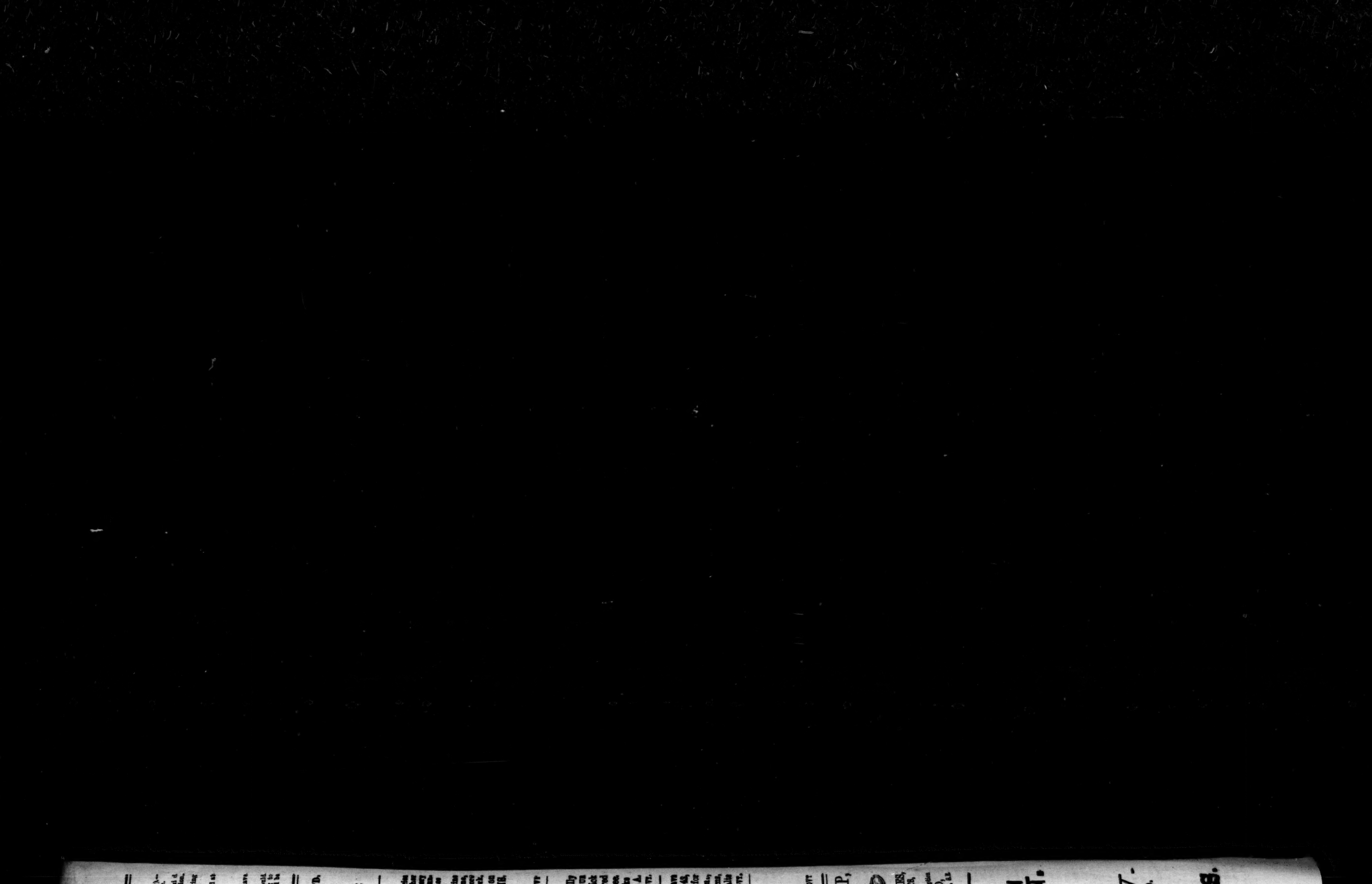
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